Policy Planning Branch

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Analysis of Origin/Destination Survey Hwy. 7 and Hwy. 410 in Brampton

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Ministry of
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Communications

Municipal
Transportation
Policy Planning
Branch

ANALYSIS OF ORIGIN/DESTINATION SURVEY
HWY. 7 AND HWY. 410 IN BRAMPTON
JUNE, 1985

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Zone Trips O and D by Auto and Truck Hwy 410

1. INTRODUCTION

1.1 Purpose of the Survey

This survey was initiated by the Municipal Transportation Policy Planning Branch, Transportation Demand Research Office, Ministry of Transportation and Communications. The main objective of this study was to identify the travel patterns in the Hwy. 7 and Hwy. 410 area in Brampton in order to aid in the planning of Hwy. 407.

The secondary objectives were to identify:

- the composition of auto and truck traffic;
- the auto trip purpose and occupancy;
- the hourly distribution of auto and truck traffic;
- the trip distribution pattern;
- the characteristics of trip length distribution.

1.2 Location of Survey

On Tuesday, June 4, 1985, the survey was conducted for a twelve hour period from 7 AM to 7 PM on two eastbound lanes of Hwy. 7 to identify the west-east direction travel patterns, and on one southbound lane of Hwy. 410 to identify the trips on this highway destined to some location north of 401 - east of the survey stations that could be attracted potentially to the Highway 407. The specific locations of the survey stations were as follows:

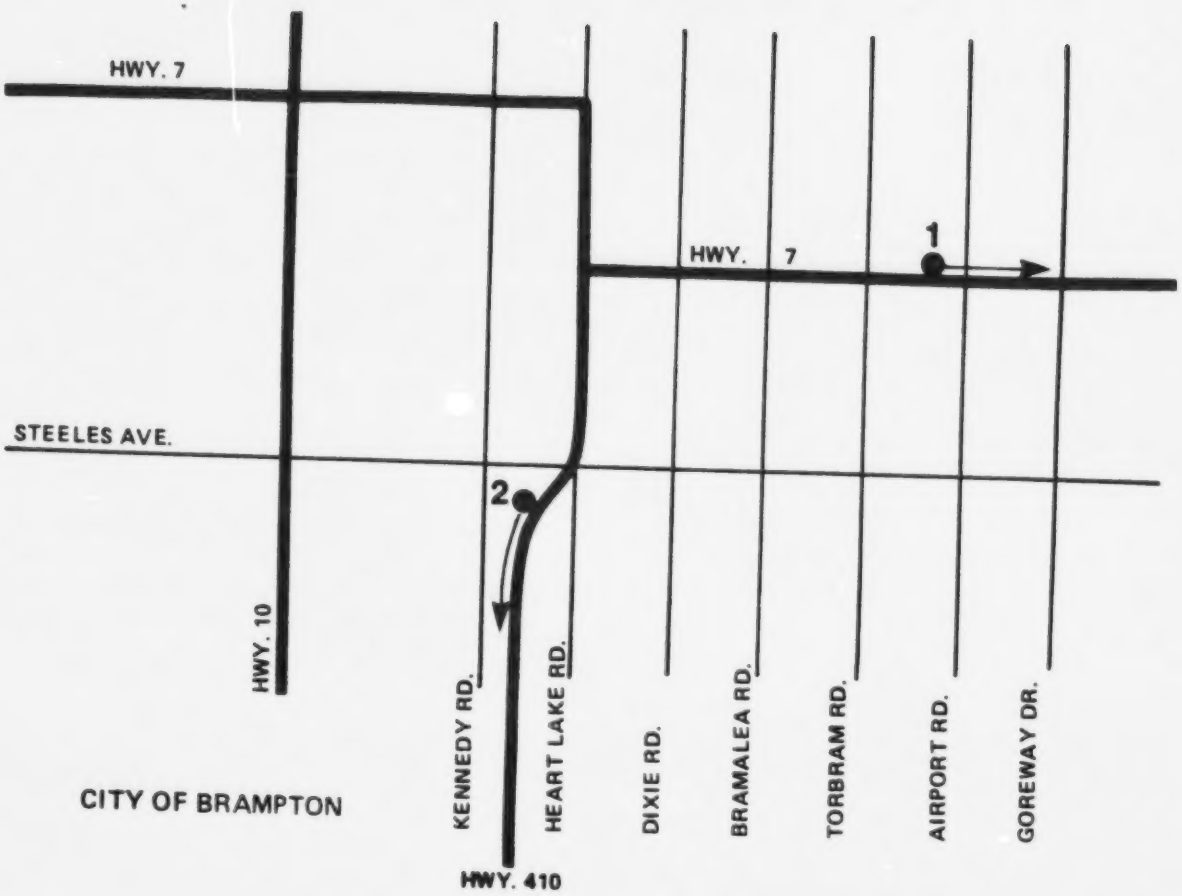
Station 1 - Hwy. 7 eastbound, 1000 ft. west of Airport Road

Station 2 - Hwy. 410 southbound, 1000 ft. south of Steeles Ave.

A diagram indicating the locations of these stations is shown in Figure 1.1.

Figure 1.1

LOCATION OF SURVEY STATIONS - (1985)



STATION 1: HWY. 7 WEST OF AIRPORT RD. (EASTBOUND)

STATION 2: HWY. 410 SOUTH OF STEELES AVE. (SOUTHBOUND)

2. SURVEY PROCEDURE

2.1 General Methodology

The licence plates of every other car and truck passing the survey station were recorded. At Station 1, two eastbound lanes on Hwy. 7 were surveyed by a crew of two students for each lane. One person read the licence number and the other person recorded the number on a sheet. A crew of three students read and recorded the licence numbers at station 2 on one southbound lane on Hwy. 410 because traffic moved fast. Frequent trips were made to deliver the survey sheets from the site to the MTC Data Conversion Unit starting from 10:00 AM and finishing at 8:00 PM

The licence plate characters and the hour-ending time when the vehicle passed the survey station were keypunched and transferred into computer terminals. Due to a computer system breakdown on the survey day, the storage of survey data onto disks were delayed until the next day morning, June 5. The survey data provided the input to a computer program that searched the Master Vehicle Registration File overnight in order to match and print the names and addresses of the registered vehicle owners. Another computer program was set up to laser print the licence number, the name and address of the vehicle owner and the survey hour at the appropriate spaces on each questionnaire. Due to a problem that occurred in the operation of the printer, frequent stoppage of the printing process caused duplication of names and addresses on the questionnaires; the process was not completed until noon, June 6.

All questionnaires were sent to the printing room for folding and then delivered to the field survey staff for enveloping and when this operation was completed the envelopes were sent to the Postal Room for mailing.

2.2 Questionnaires

Copies of the auto and truck questionnaires for this surveys are shown in Appendix A.

2.3 Confidentiality

When the vehicle owner received a questionnaire, the person was advised to detach the portion of the questionnaire above the name and the address line to ensure confidentiality. The returned portion, therefore, would be without the name, address and licence number. If the upper part was not removed, it was left intact until the coding of the questionnaire was completed and subsequently removed for shredding.

2.4 Vehicle Registration File Search

The number of vehicle licence plates recorded, names and addresses of vehicle owners identified and, finally, the questionnaires available for mailing are tabulated as follows:

Licence numbers identified	10,350
After the Vehicle Registration File search, questionnaires printed with names and addresses of vehicle owners	9,186
Questionnaires with vehicle owners being vehicle leasing, rental companies and car dealers	463
Questionnaires available for mailing to vehicle owners	8,723

2.5 Response

Of the 8723 questionnaires mailed, 401 were returned with uncodeable response. In all, 2254 questionnaires were properly completed and returned yielding an overall response rate of 25.8%.

The sampling rates of the total vehicle population in the 12 hour survey period by auto and truck are tabulated below:

Stn.	Hwy.	12 Hr. Classification Counts		Codeable Questionnaires		Sample %	
		Auto	Truck	Auto	Truck	Auto	Truck
1	7	13,208	921	1,156	468	8.7	50.8
2	410	5,207	891	364	266	7.0	29.8

2.6 Expansion factors

The coded questionnaires were separated by auto and truck and further sorted by the hour of the survey period. As auto and truck volumes were counted by the hour of the survey period, expansion factors were calculated by hours and also by auto and truck. Thus, survey samples were factored up to the total population of the vehicular traffic.

3. VEHICLE CLASSIFICATION COUNTS

3.1 Hourly Distribution

During the 7 AM - 7 PM survey period, hourly vehicle classification counts were taken on traffic in both directions at the two survey stations. A summary of tabulation of field classification count sheets is shown in Appendix B. The grouping of vehicle types in the classification counts is shown in pictorial form in Appendix C.

An analysis of the previous year's automatic machine counts at these two survey locations indicated the percentages of the 7 AM - 7 PM traffic volumes in relation to the daily traffic volumes. The AM and PM peak hour traffic and 7 AM - 7 PM traffic as the percentages of daily traffic at the survey locations are shown in Table 3.1.

Table 3.1 Traffic Volumes by Time Period and as the Percentage of Daily Volume

Time Period	Hwy. 7	Hwy. 410
24 Hr.	37931 (100.%)	16425 (100.%)
7 AM - 7 PM	28183 (74.3%)	12828 (78.1%)
7 - 8 AM	3260 (8.6%)	1560 (9.5%)
4 - 5 PM		1547 (9.4%)
5 - 6 PM	3599 (9.5%)	

The directional splits of the AM and PM peak period traffic, as well as the 7 AM - 7 PM traffic at the two survey locations are shown in Table 3.2.

Table 3.2 Directional Split by Time Period

Time Period	Hwy. 7		Hwy. 410	
	E.B.	W.B.	N.B.	S.B.
7 AM - 9 AM	4245	1772	1383	1421
%	(0.70)	(0.30)	(0.49)	(0.51)
4 PM - 6 PM	2515	4505	1587	1255
%	(0.36)	(0.64)	(0.56)	(0.44)
7 AM - 7 PM	14129	14054	6730	6098
%	(0.50)	(0.50)	(0.52)	(0.48)

The hourly distributions of auto and truck traffic in the survey directions at the two survey stations are depicted

in Figure 3.1 and 3.2. A significant AM peak of auto traffic in the eastbound direction on Hwy. 7 indicated high volume of home-to-work trips between Brampton and the Town of Vaughan in southern York Region. On Hwy. 410, the southbound traffic in both AM and PM peak period were significantly higher than those in the other hours which reflects home-to-work linkages in both directions. Hourly truck volumes on both highways were fairly even from 8 AM - 5 PM period.

3.2 Percentage of Commercial Vehicles

Within the 12 hour period, the truck percentage varied substantially in different hours of the day as shown below:

Hour	Percentage of Commercial Vehicle	
	Hwy. 7 (E.B.)	Hwy. 410 (S.B.)
7 AM - 8 AM	2.8%	6.6%
11 AM - 12 AM	10.5%	24.4%
5 AM - 6 PM	4.4%	6.5%
7 AM - 7 PM	6.5%	14.6%

FIG 3.1

HOURLY DISTRIBUTION OF TRAFFIC HWY 7 AT AIRPORT ROAD (eastbound)

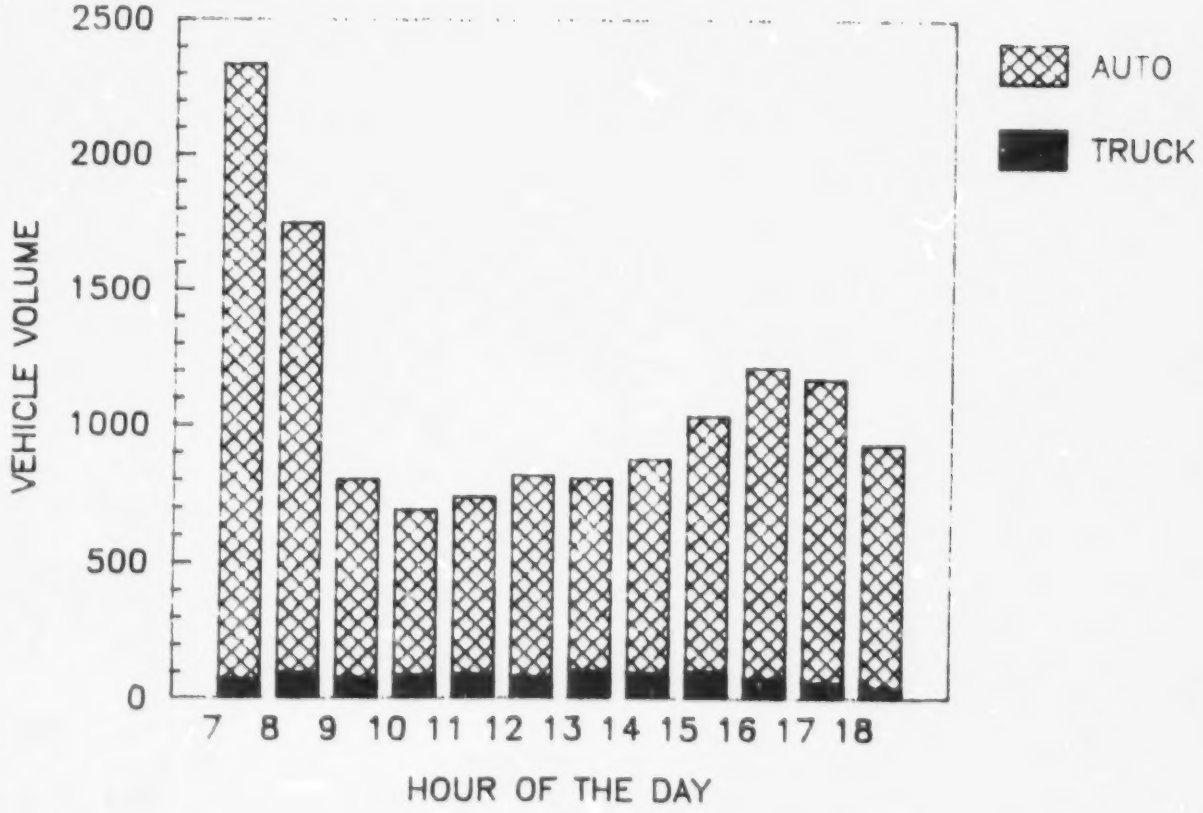
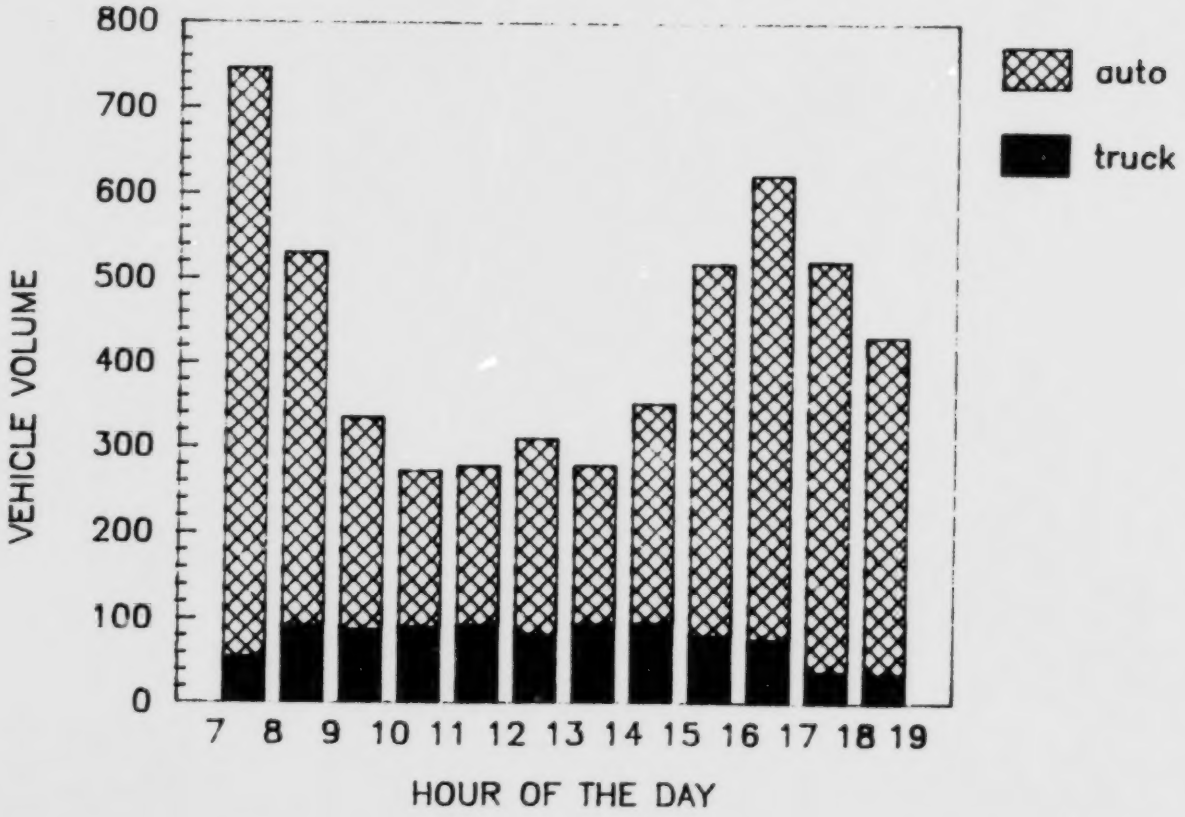


FIG 3.2

HOURLY DISTRIBUTION OF TRAFFIC ON HWY 410 AT STEELES (southbound)



4. AUTOMOBILE AND TRUCK TRAVEL

4.1 Automobile Trip Purpose

Seven trip purposes were identified in the auto questionnaires. They were grouped into five major categories, the following shows the percentage distribution.

Trip Purpose	7 AM - 7 PM		7 AM - 9 AM	
	Hwy.7	Hwy. 410	Hwy. 7	Hwy. 410
	%	%	%	%
Home to Work	42.1	36.8	84.5	89.7
Work to Home	17.9	23.9	3.8	5.1
Business	11.6	20.3	4.8	3.7
Shopping & Personal	16.9	10.2	2.6	0.8
Recreational & Other	11.0	8.2	4.1	0.8
Blank	0.5	0.6	0.2	0.0
Total	100.0	100.0	100.0	100.0

The high percentage of home-to-work trips in the morning peak period (7 - 9 AM) for the eastbound traffic on Hwy. 7 and the southbound traffic on Hwy. 410 indicated the commuter travel linking the worker's homes in the west and north respectively, with the work places in Metro Toronto and Mississauga.

4.2 Hourly Distribution by Auto Trip Purpose

Tables 4.1 and 4.2 show the auto trip percentage by trip purpose on an hourly basis for Stations 1 and 2 respectively. (See Appendix D for number of trips)The responses obtained were coded and the percentage calculated.No responses were available for the hour between 11.00 AM and 12 AM on Hwy. 7.

At Station 1, 88% of auto trips between 7 - 8 AM were home to work trips and 56% of auto trips between 4-5 PM were work to home trips. Higher percentages of business trips and shopping and personal trips occurred around mid-day. Recreational trips started after 9.00 AM and remained relatively steady till 3.00 PM.

At Station 2, almost the same pattern occurs but with different percentages. 93% of auto trips between 7 - 8 AM were home to work trips and 66% of auto trip between 4 - 5 PM were work to home trips. Higher percentage for business were 55% between 9:00 AM to 10:00 AM, the higher concentration is 36% for shopping and personal.

TABLE 4.1 AUTO TRIP PERCENTAGE OF HOURLY AUTO VOLUME BY PURPOSE

STATION 1 HWY. 7

Hour Ending	Home-To-Work %	Work-To-Home %	Business %	Shopping Personal %	Recreation Other %	Blank %	Total %
7 - 8	87.8	4.0	4.1	1.7	2.4	0	100
8 - 9	80.2	3.4	5.7	4.6	5.5	0.6	100
9 - 10	37.3	1.2	21.6	19.4	20.5	0	100
10 - 11	14.0	3.6	19.3	38.6	24.5	0	100
*11 - 12	0	0	0	0	0	0	100
12 - 13	15.5	4.1	23.7	41.2	14.5	1.0	100
13 - 14	15.3	10.3	25.4	28.7	20.3	0	100
14 - 15	33.3	6.9	16.6	24.9	16.9	1.4	100
15 - 16	28.0	27.0	18.0	13.5	13.5	0	100
16 - 17	13.2	55.8	8.0	15.9	7.1	0	100
17 - 18	12.6	52.4	6.8	20.3	7.9	0	100
18 - 19	26.9	30.1	3.2	22.2	14.4	3.2	100
TOTAL	42.1	17.9	11.6	17.0	11.0	0.5	100

* No answers available for this period

TABLE 4.2 AUTO TRIP PERCENTAGE OF HOURLY AUTO VOLUME BY PURPOSE

STATION 2 HWY. 410

Hour Ending	Home-To-Work %	Work-To-Home %	Business %	Shopping Personal %	Recreation Other %	Blank %	Total %
7 - 8	92.9	4.8	2.3	0	0	0	100
8 - 9	85.5	5.5	5.3	1.9	1.9	0	100
9 - 10	14.9	4.8	55.1	15.2	10.1	0	100
10 - 11	18.7	0	50.1	18.7	12.5	0	100
11 - 12	5.7	11.8	41.3	35.5	5.7	0	100
12 - 13	27.7	0	33.4	27.6	11.3	0	100
13 - 14	29.3	5.7	36.1	11.4	17.5	0	100
14 - 15	38.0	4.8	42.8	0	14.4	0	100
15 - 16	26.0	29.1	22.5	12.7	6.4	3.3	100
16 - 17	12.5	66.1	5.3	9.0	7.1	0	100
17 - 18	10.3	64.2	5.2	10.2	10.2	0	100
18 - 19	18.7	46.7	9.2	6.5	15.7	3.2	100
TOTAL:	36.8	23.9	20.3	10.2	8.2	0.6	100

Figures 4.1 and 4.2 show the hourly distribution of auto trips for the five trip purpose categories and the total for each the stations. In both cases, the home-to-work trip curves shows that the highest peak occurred between 7 - 8 AM and to a lesser extent in the next hour. The work to home trip curve indicates a peak between 4 - 5 PM. The curves for the other trip purposes indicate that traffic started to pick up after 9.00 AM and remained fairly steady throughout the day.

4.3 Auto Occupancy

Table 4.3 shows the average occupancy rates (persons per car) by trip purpose for the 7 AM - 7 PM period for Stations 1 and 2 respectively.

Table 4.3 Average Auto Occupancy Rates by Trip Purpose

Trip Purpose	Station 1 7 AM - 7 PM	Station 2 7 AM - 7 PM
Home to Work	6324/5236 = 1.21	2157/1915 = 1.13
Work to Home	2510/2219 = 1.13	1365/1247 = 1.09
Business	1856/1437 = 1.29	1189/1055 = 1.13
Shopping & Personal	3579/2107 = 1.70	863/ 532 = 1.62
Recreational & Other	2758/1368 = 2.01	690/ 427 = 1.62
Total	17027/12367 = 1.38	6264/5176 = 1.21

Similar to previous O-D surveys, work and business trips had lower occupancy rates while shopping, personal, recreation, and others trips had higher rates.

4.4 Auto and Truck Trip Distribution Patterns

Origin-destination trips give a disaggregate view of auto and truck travel patterns through each of the survey stations.

The O-D trip information from the survey data was coded to the 1321 TARMS zone system. Trip tables by auto work, non-work and truck were built and compressed to 127 planning districts within the TARMS area, then the information was grouped into regions as shown in Tables 4.4, 4.5, 4.6 and 4.7 for each station and for 7 - 9 AM as well as 7 AM - 7 PM time periods respectively.

For Station 1, Brampton was the main generator with more than 90% of the auto work origins during the peak and the extended time periods. In general, the origins were clearly focused around Brampton, Mississauga, and Halton. The destinations were more dispersed, but there was a

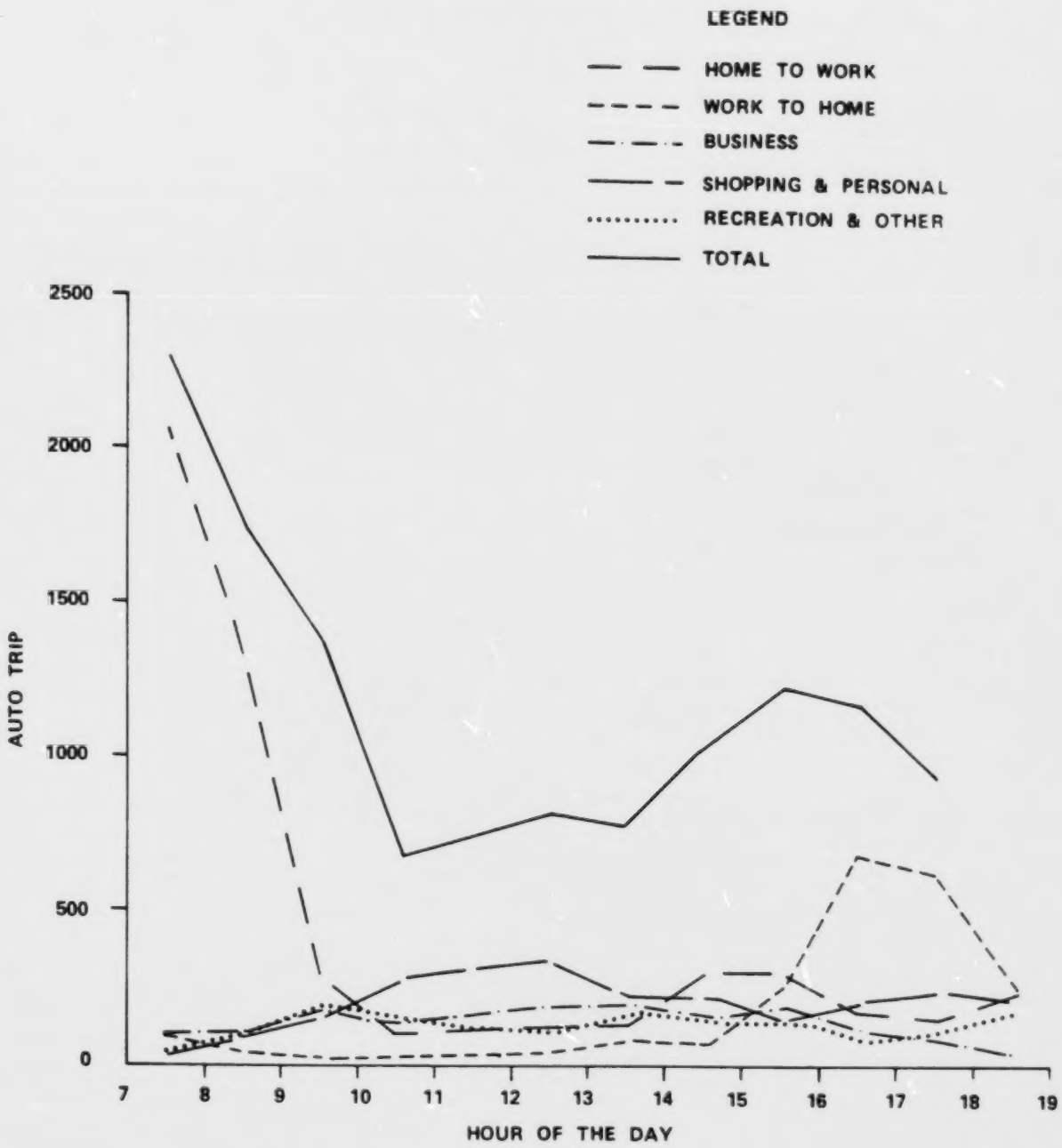


Figure 4.1

HOURLY DISTRIBUTION OF AUTO TRIPS BY TRIP PURPOSE
STATION 1 – HWY 7

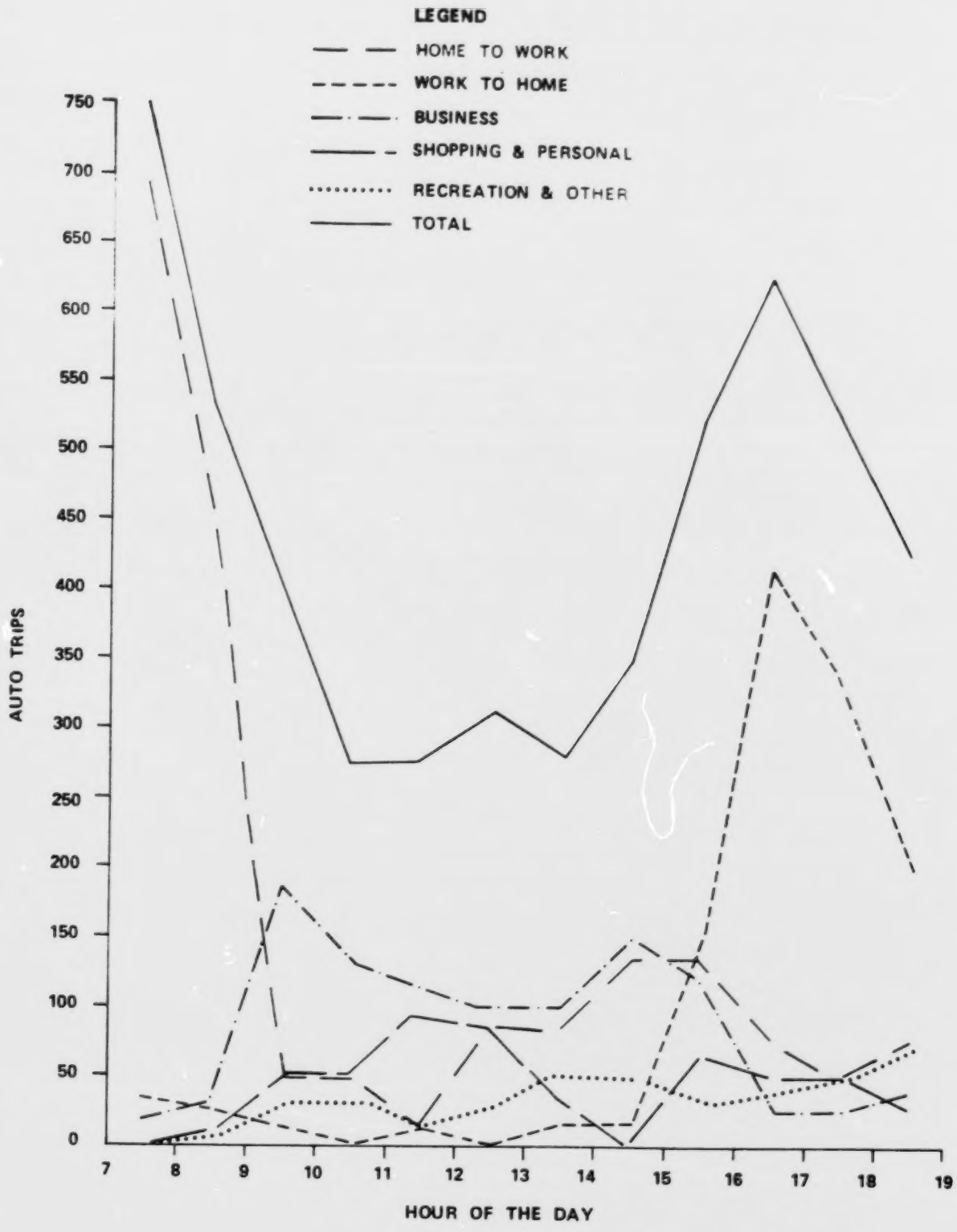


Figure 4.2
HOURLY DISTRIBUTION OF AUTO TRIPS BY TRIP PURPOSE
STATION 2 – HWY 410

TABLE 4.4

Origins & Destinations by Auto & Truck Trips
by Trip purpose for Station 1 (Hwy. 7)
(7:00 AM - 9:00 AM)

Origin	Auto Trips Work	%	Non Work	%	Truck Trips	%
Brampton	3353	94.66	367	82.10	71	62.84
Mississauga N	30	0.85	30	6.71	7	6.19
Mississauga S	80	2.26	10	2.24	3	2.65
Vaughan	-	-	-	-	7	6.19
Halton	-	-	-	-	8	7.08
Others	79	223	40	8.95	17	15.05
TOTAL:	**3542**	**100.00**	**447**	**100.00**	**113**	**100.00**

Destination	Auto Trips Work	%	Non Work	%	Truck Trips	%
North York*	1005	28.37	89	19.91	22	19.47
Etobicoke	858	24.22	40	8.95	10	8.85
Vaughan	426	12.03	70	15.66	26	23.00
Mississauga N	340	9.60	20	4.47	7	6.20
Brampton	302	8.53	78	17.45	10	8.85
North York**	256	7.23	40	8.95	4	3.54
Downtown	100	2.82	10	2.24	13	11.50
Markham	78	2.20	40	8.95	7	6.20
Others	177	5.00	60	13.42	14	12.39
TOTAL:	**3542**	**100.00**	**447**	**100.00**	**113**	**100.00**

*** N. of 401** ****S. of 401**

TABLE 4.5

Origins & Destinations by Auto & Truck Trips
by Trip purpose for Station 1 (Hwy. 7)
(7:00 AM - 7:00 PM)

Origin	Auto Trips Work	%	Non Work	%	Truck Trips	%
Brampton	6166	91.15	2804	75.03	581	72.72
Mississauga	289	4.27	383	10.25	84	11.75
Halton	90	1.33	99	2.65	36	4.51
Bolton	0	0	94	2.52	0	0
Others	220	3.25	357	9.55	88	11.02
TOTAL:	**6765**	**100.00**	**3737**	**100.00**	**799**	**100.00**

Destination	Auto Trips Work	%	Non Work	%	Truck Trips	%
North York*	1834	27.11	634	16.97	90	11.26
Etobicoke	1190	17.59	485	12.98	117	14.64
Vaughan	941	13.91	358	9.58	152	19.02
Brampton	647	9.56	809	21.65	120	15.02
North York**	563	8.32	310	8.30	39	4.89
Markham	522	7.72	278	7.43	68	8.51
Mississauga	366	5.41	203	5.43	55	6.88
DnTown Toronto	301	4.45	0	0	66	8.26
Scarborough	248	3.66	123	3.29	43	5.39
Bolton	153	2.26	51	1.36	49	6.13
Others	0	0	486	13.01	0	0
TOTAL:	**6765**	**100.00**	**3737**	**100.00**	**799**	**100.00**

* N. of 401

**S. of 401

TABLE 4.6

Origins & Destinations by Auto & Truck Trips by Trip purpose for Station 2 (Hwy. 410) (7:00 AM - 9:00 AM)

Origin	Auto Trips Work	%	Non Work	%	Truck Trips	%
Brampton	1146	95.18	57	85.07	483	76.79
Bolton	38	3.16	10	14.93	39	6.20
Mississauga	0	0	0	0	60	9.54
Others	20	1.66	0	0	47	7.47
TOTAL:	**1204**	**100.00**	**67**	**100.00**	**62.9**	**100.00**

Destination	Auto Trips Work	%	Non Work	%	Truck Trips	%
Mississauga N	345	28.65	20	29.85	124	19.70
Etobicoke	309	25.66	10	14.92	72	11.45
Mississauga S	251	20.85	0	0	73	11.60
DnTown Toronto	165	13.70	27	40.30	17	2.70
North York**	48	3.99	0	0	21	3.34
West End	38	3.16	0	0	4	.64
North York*	28	2.33	0	0	91	14.47
East York	10	.83	0	0	13	2.07
Scarborough	0	0	0	0	81	12.88
East End	0	0	0	0	21	3.34
Brampton	0	0	10	14.93	52	8.27
Others	10	.83	0	0	60	9.54
TOTAL:	**1204**	**100.00**	**67**	**100.00**	**629**	**100.00**

*** N. of 401** ****S. of 401**

TABLE 4.7

Origins & Destinations by Auto & Truck Trips
by Trip purpose for Station 2 (Hwy. 410)
(7:00 AM - 7:00 PM)

Origin	Auto Trips					
	Work	%	Non Work	%	Truck Trips	%
Brampton	2971	96.79	1731	88.41	527	78.42
Bolton	55	1.79	43	2.20	17	2.53
Mississauga N.	10	.32	45	2.30	55	8.18
Mississauga S	13	.42	43	2.20	42	6.25
Halton N.	10	.32	0	0	0	0
Oakville	11	.36	48	2.45	14	2.08
Etobicoke	0	0	32	1.63	7	1.04
Others	0	0	16	.82	10	1.50
TOTAL:	**3077**	**100.00**	**1958**	**100.00**	**672**	**100.00**

Destination	Auto Trips					
	Work	%	Non Work	%	Truck Trips	%
Etobicoke	752	24.44	299	15.27	104	15.48
Mississauga S	557	18.10	310	15.83	41	6.17
Mississauga N	525	17.06	257	13.13	140	20.83
DnTown Toronto	495	16.09	426	21.76	57	8.48
North York**	231	7.51	218	11.13	42	6.25
North York*	127	4.13	95	4.85	25	3.72
East York	125	4.06	28	1.43	22	3.17
S. Scarborough	75	2.44	58	2.96	30	4.46
East End	76	2.47	67	3.42	81	12.05
West End	73	2.37	42	2.15	27	4.02
Brampton	41	1.33	73	3.73	103	15.23
Others	0	0	85	4.34	0	0
TOTAL:	**3077**	**100.00**	**1958**	**100.00**	**672**	**100.00**

* N. of 401

**S. of 401

clear west-east tendency north of highway 401 which in the future could attract traffic to highway 407.

The auto work trips for the peak and the extended period present almost the same destinations. The non-work and truck trips have more dispersed destinations and those with little incidence to highway 407 were grouped under "others".

For Station 2, Brampton was also the main generator with more than 95% of the auto work origins during the peak and the extended time periods. The several destinations presented a clear north-south movement tendency, with less than 10% of the auto work trips during the peak hours that may be attracted for highway 407. Looking at the non-work trips, this percentage goes down to 0%. The case of trucks is different with the possibility of 33% of them going to highway 407.

For the 12 hour period, the percentages of possible traffic being attracted to highway 407 goes up to 20%, 24% and 30% for the work, non-work and truck trips respectively.

A graphical presentation of this trip distribution patterns observed in both stations are shown in figures 4.3 and 4.4

Appendix E shows the origins and destinations by auto and truck by 7 AM - 7 PM and 7 AM - 9 AM for the 127 zones.

4.5 Auto and Truck Trip Length Frequency Distribution

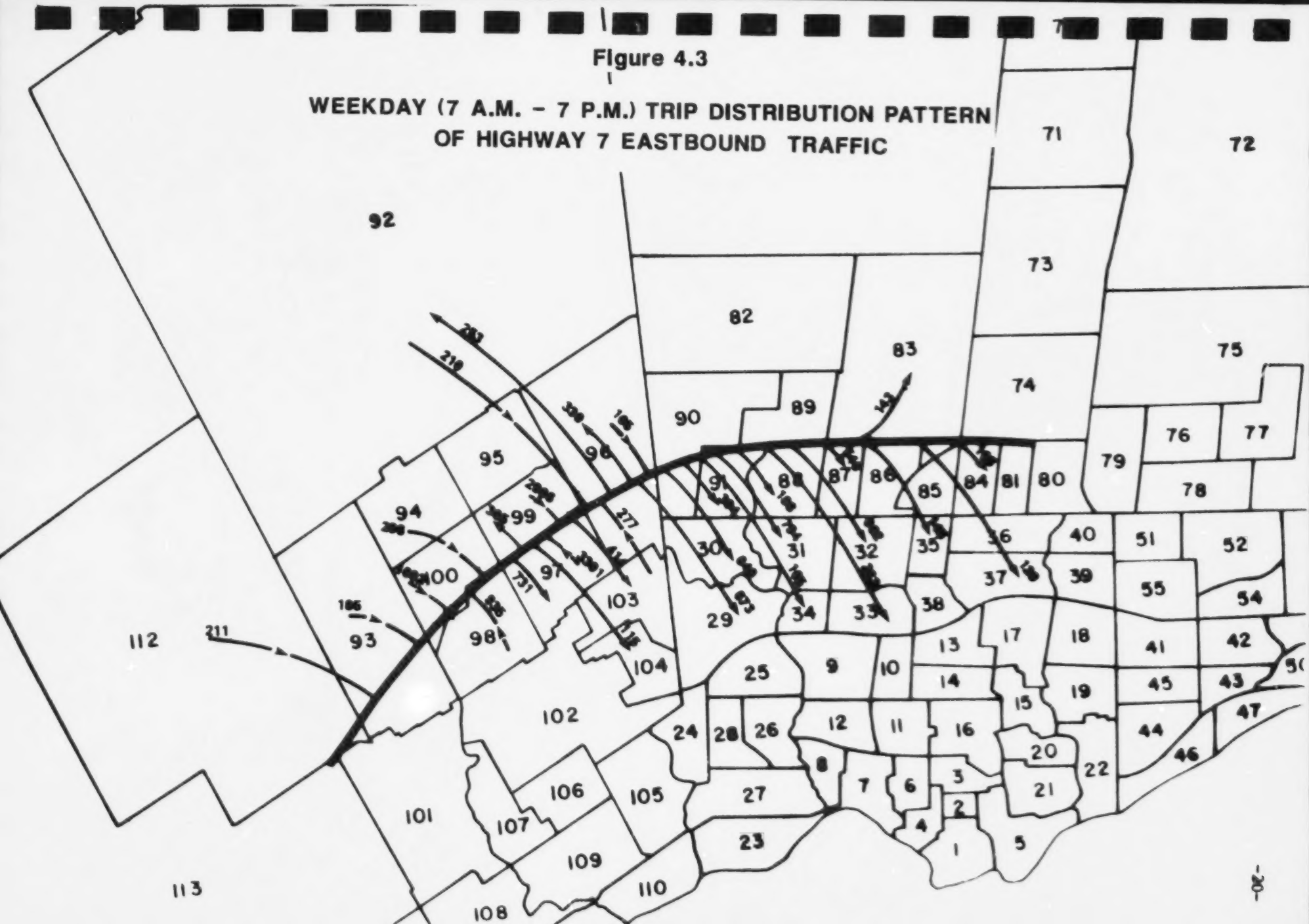
The 7 AM - 7 PM and 7 AM - 9 AM peak period traffic data were analysed to plot the trip length frequency distribution graphs and to calculate the weighted mean trip lengths in terms of kilometres and miles by auto and truck trips.

These graphs are illustrated as follows:

Figure	Trip Length Distribution		
4.5	Total Auto Trips	Hwy. 7	7 AM - 7 PM
4.6	Total Trips	Hwy. 7	7 AM - 9 AM
4.7	Total Truck Trips	Hwy. 7	7 AM - 7 PM
4.8	Total Auto Trips	Hwy. 410	7 AM - 7 PM
4.9	Total Trips	Hwy. 410	7 AM - 9 AM
4.10	Total Truck Trips	Hwy. 410	7 AM - 7 PM

Figure 4.3

WEEKDAY (7 A.M. – 7 P.M.) TRIP DISTRIBUTION PATTERN
OF HIGHWAY 7 EASTBOUND TRAFFIC



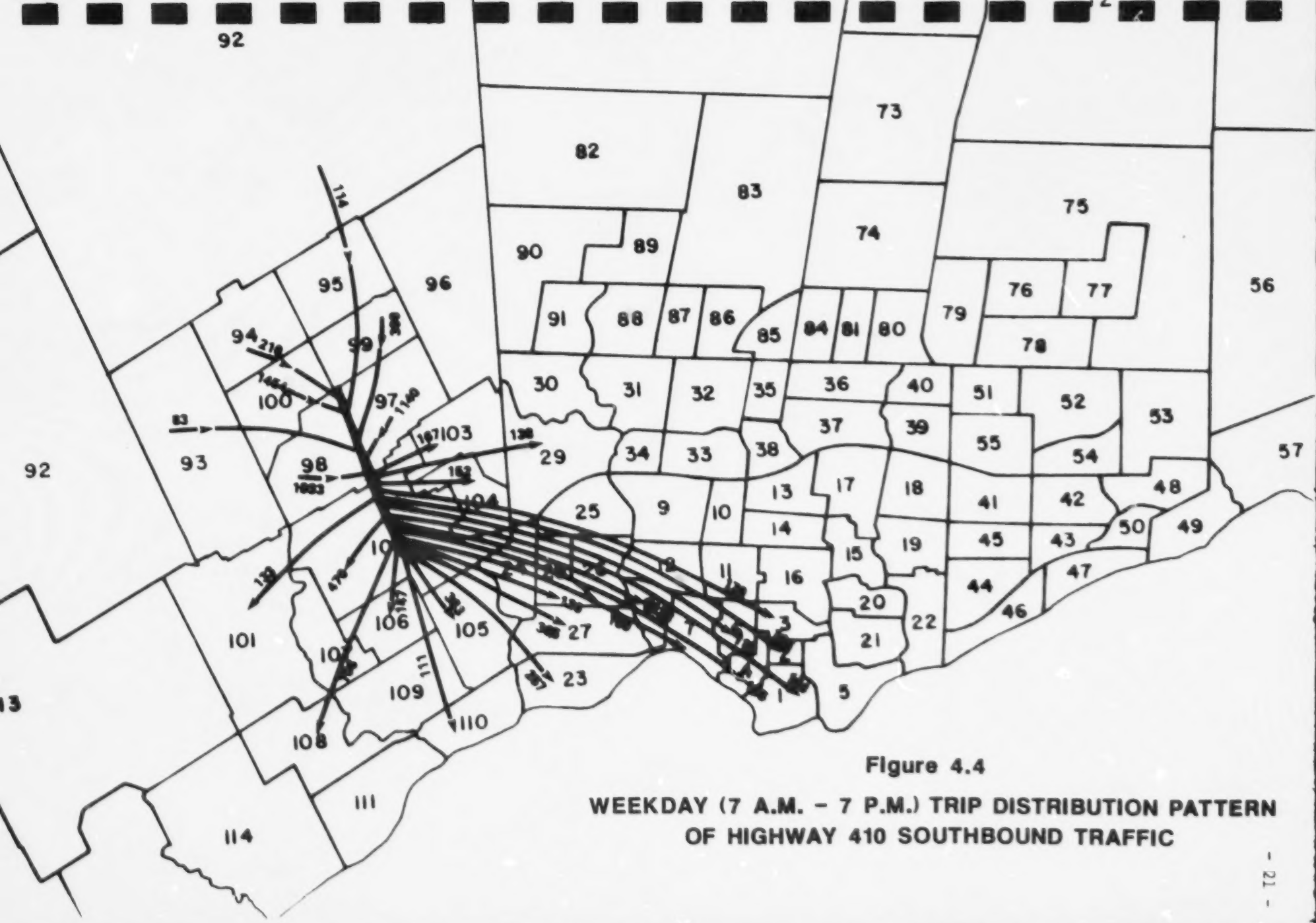


Figure 4.4

WEEKDAY (7 A.M. – 7 P.M.) TRIP DISTRIBUTION PATTERN OF HIGHWAY 410 SOUTHBOUND TRAFFIC

FIGURE 4.5

TRIP LENGTH DISTRIBUTION

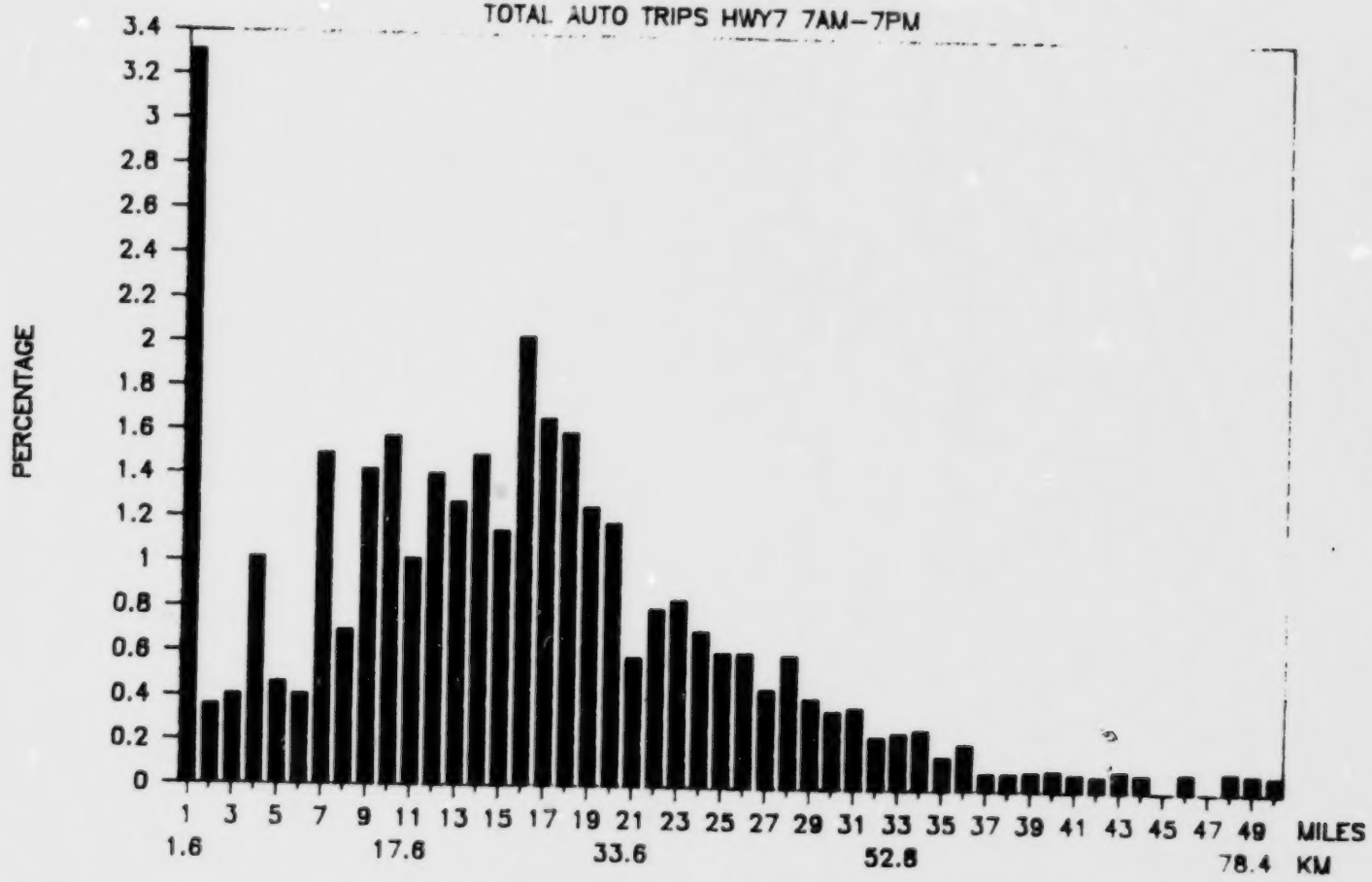


FIGURE 4.6

TRIP LENGTH DISTRIBUTION

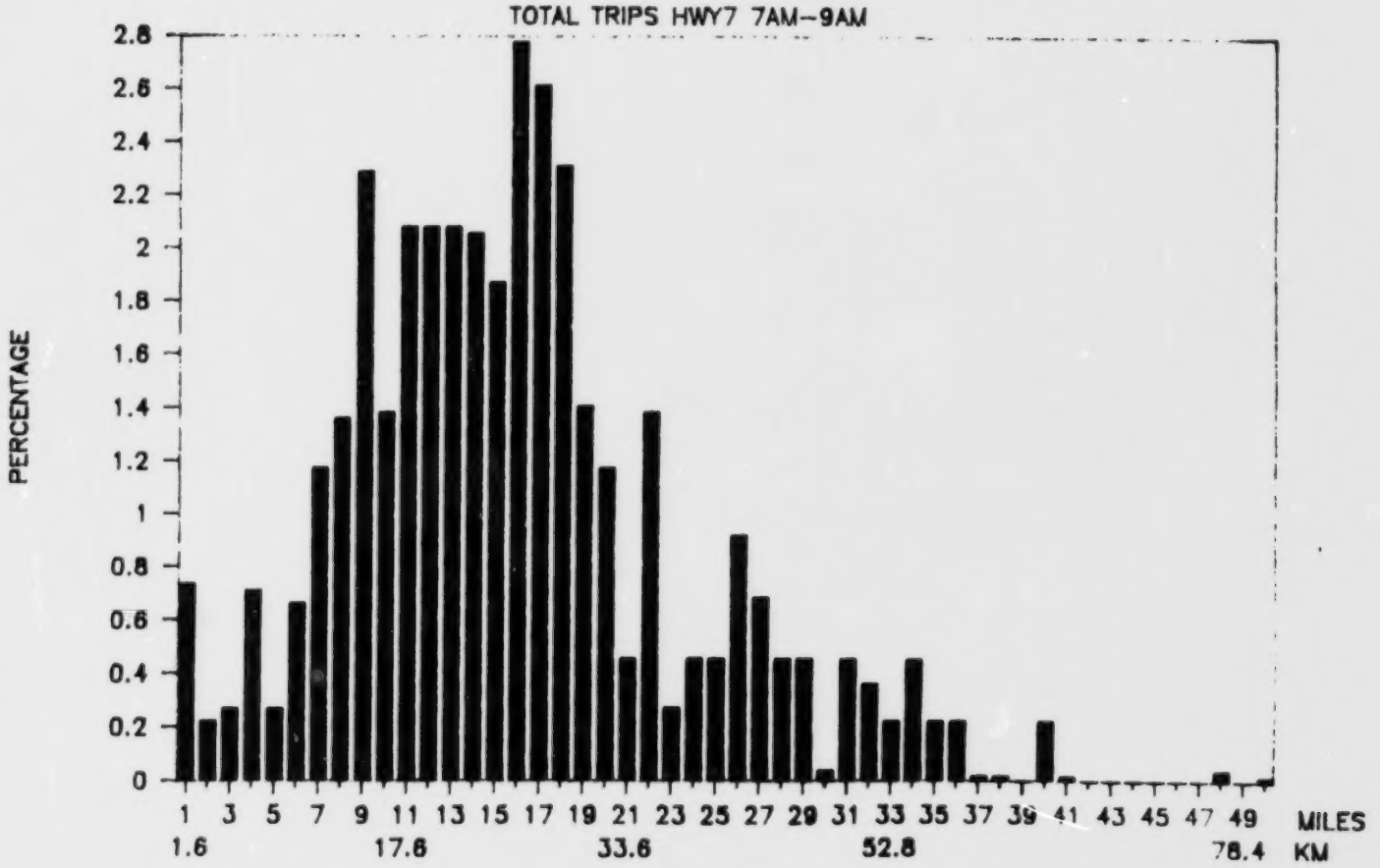


FIGURE 4.7

TRIP LENGTH DISTRIBUTION

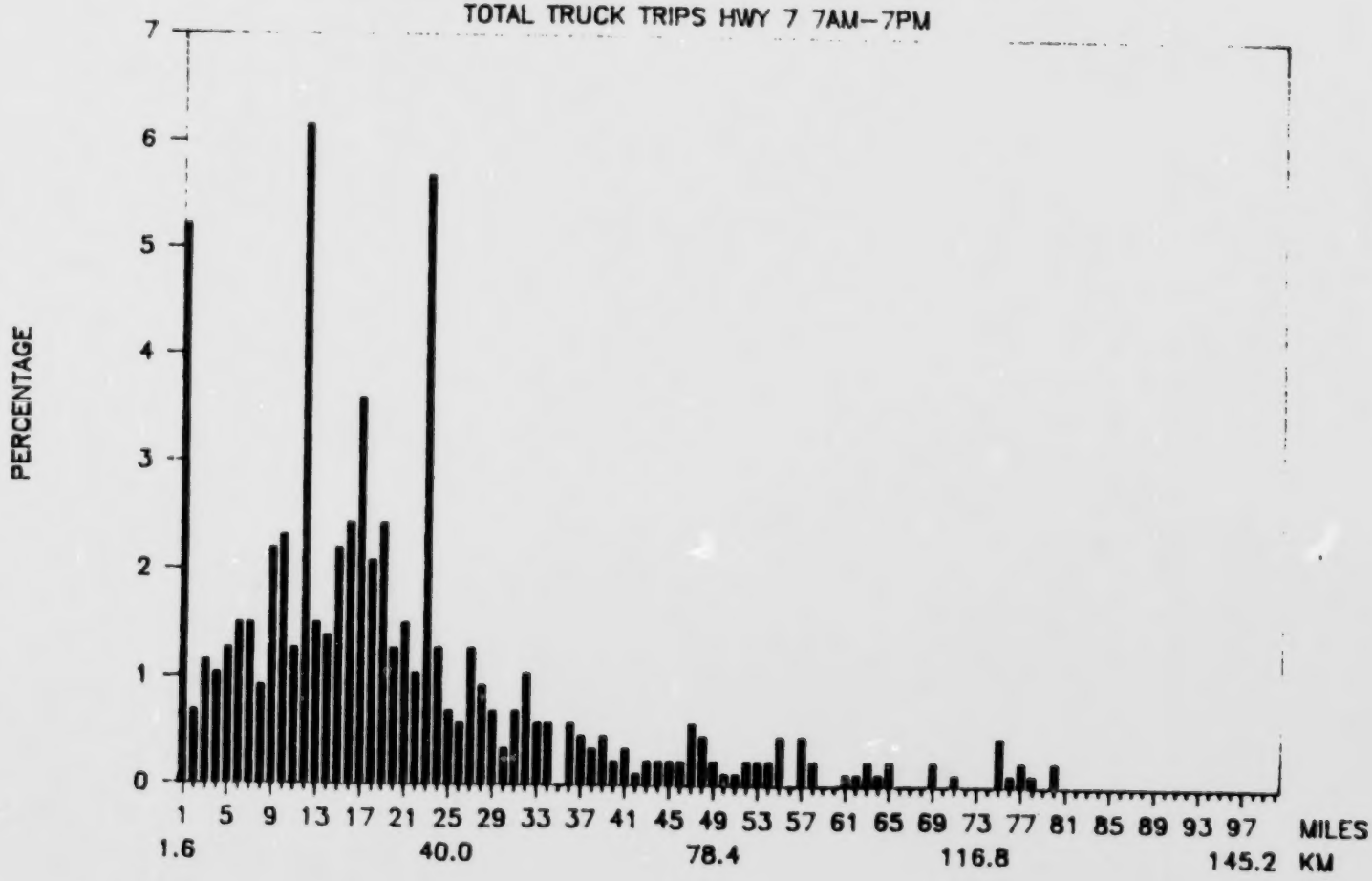


FIGURE 4.8

TRIP LENGTH DISTRIBUTION

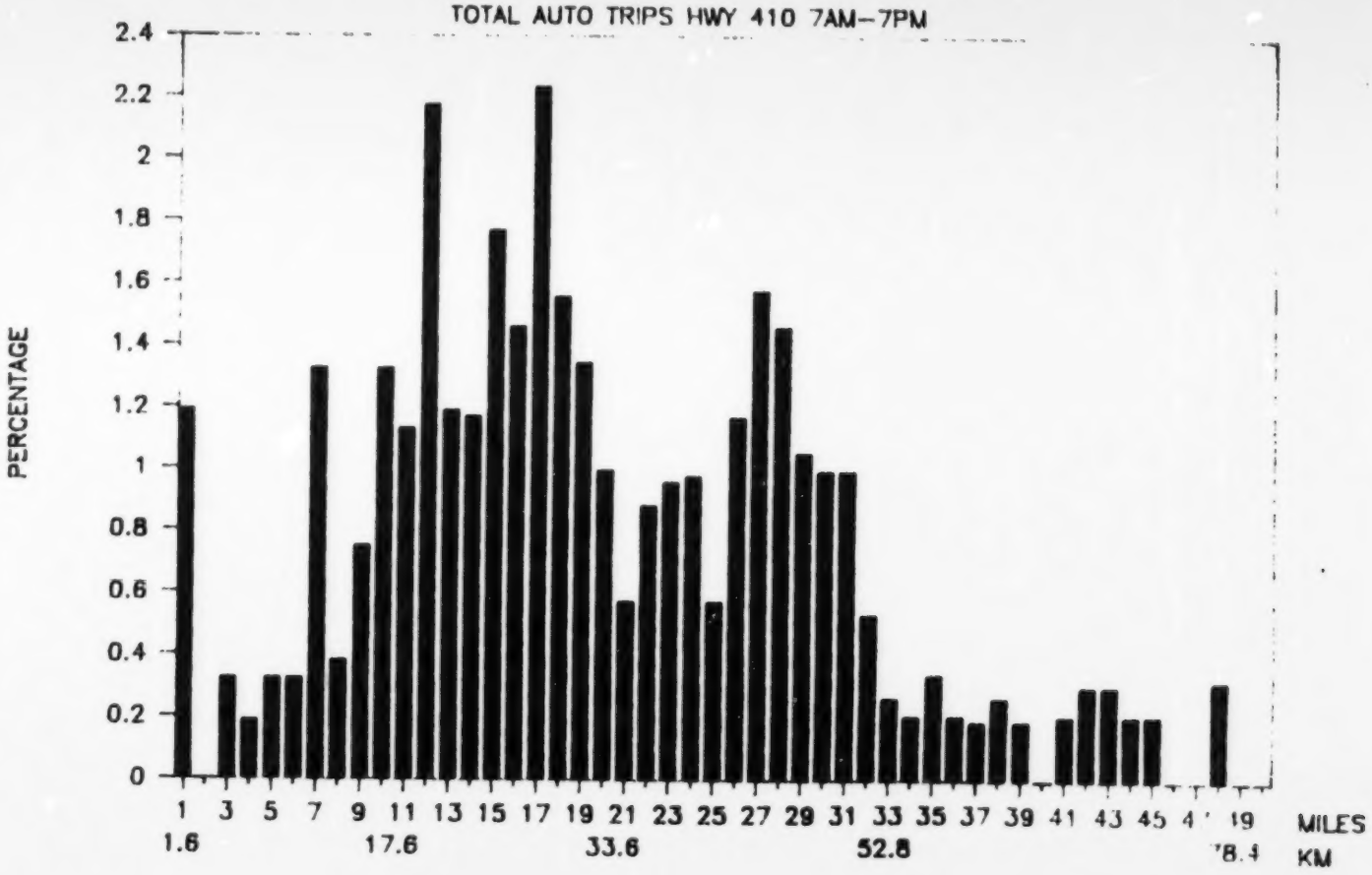


FIGURE 4.9

TRIP LENGTH DISTRIBUTION

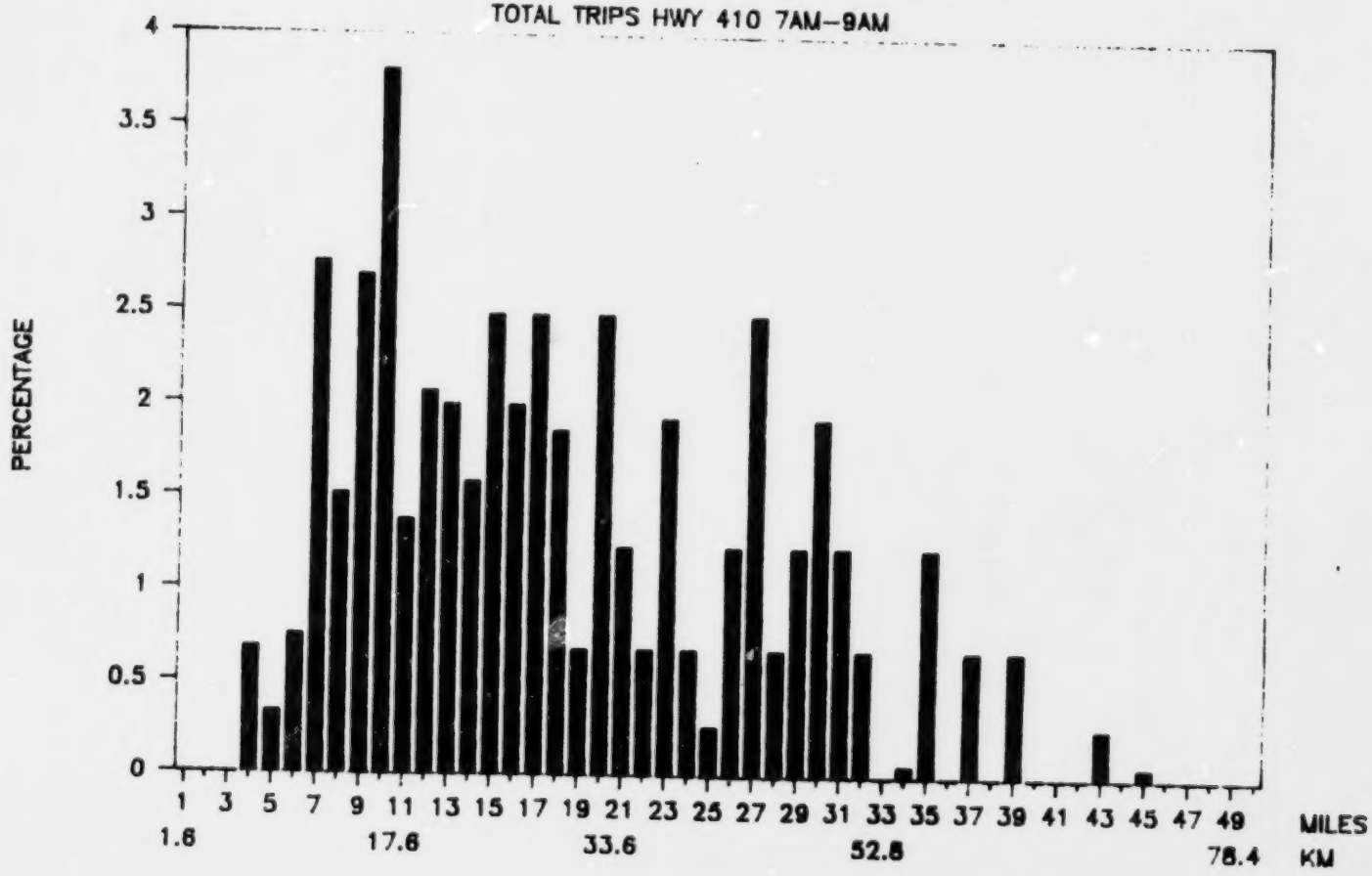
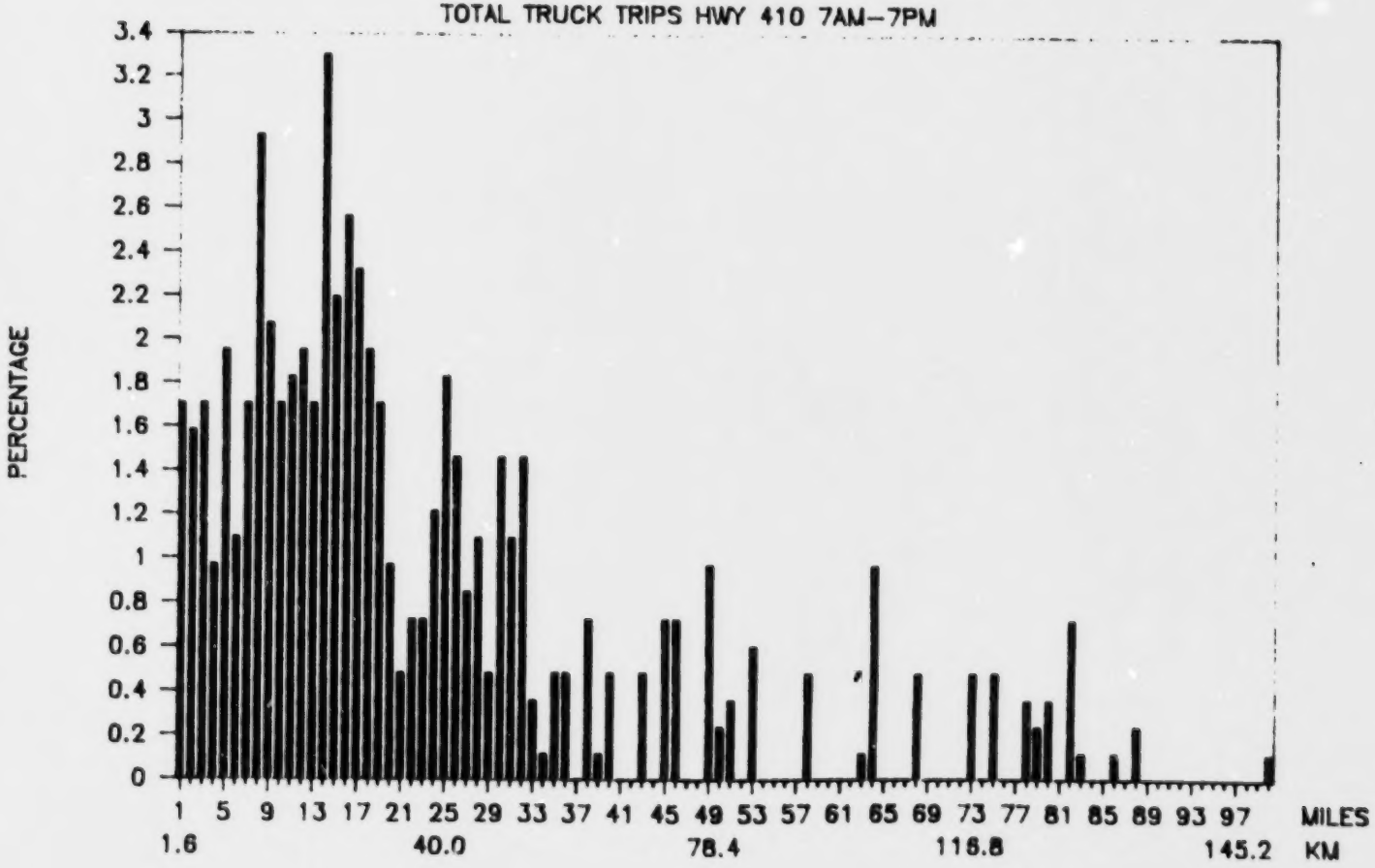


FIGURE 4.10

TRIP LENGTH DISTRIBUTION



The weighted mean trip lengths by vehicle type and station are tabulated as follows

Time Period	Vehicle Type	Station	Weighted Mean Trip Km	Mile
7 AM - 7 PM	Auto	1 Hwy. 7	29	18
7 AM - 9 AM	Auto	1 Hwy. 7	26	16
7 AM - 7 PM	Truck	1 Hwy. 7	35	22
7 AM - 7 PM	Auto	2 Hwy. 410	30	19
7 AM - 9 AM	Auto	2 Hwy. 410	29	18
7 AM - 7 PM	Truck	2 Hwy. 410	48	30

*Weighted Mean trip = $\frac{\text{Sum of (No. of trips x Trip Length)}}{\text{Total No. of Trips}}$

The travel distance was average for this type of highways. As can be seen in the graphics, most of the distances were between 7 and 30 miles. The weighted mean auto trips indicates very little difference between the peak and the extended period for both stations.

In the case of autos few trips were traveling distances longer than 50 miles (not shown in the graphics). During the extended period 7 AM -7 PM, 7.2 % of auto trips going through Station 1 mentioned destinations further than 50 miles away (under others in table 4.5) This percentage goes down to 2% during the 7 AM - 9 AM period, where 87% are home to work trips.

On Station 2 (Hwy. 410) for the 7 AM - 7 PM period, 2.6% of the auto trips were travelling longer than 50 miles, while in the 7 - 9 AM period, this percentage reached 3.3%.

The weighted mean distance trip for trucks was 22 miles on highway 7 and 30 miles on highway 410. On highway 7, only 3% were travelling more than 100 miles indicating high concentration of urban trips. On highway 410 this percentage goes up to 8.7% indicating that for trucks more intercity trips travel through highway 410 than through highway 7.

4.6 Trip Frequency

The frequency of auto and truck trip occurrence in percentage in terms of times per day, per week and per month, are shown in Tables 4.8 and 4.9 for stations 1 and 2 respectively.

The highest concentration for autos is five times per week in both stations which is expected because of the high number of home to work trips. In the case of trucks the highest percentage is for two times per day trips.

TABLE 4.8 Station 1 (Hwy. 7)

Frequency of Auto Trips by Percentage

Times	<1	1	2	3	4	5	6	7	8	9	10	>10	Total
Per Week	0.2	3.8	6.0	4.7	4.5	67.7	6.2	1.0	0.6	-	4.3	1.1	100%
Per Month	1.0	15.2	20.6	7.9	6.7	2.8	1.6	-	2.4	-	3.8	38.0	100%

Frequency of Truck Trips by Percentage

Times	<1	1	2	3	4	5	6	7	8	9	10	>10	Total
Per Day	-	12.7	53.7	16.8	10.8	1.1	-	0.3	0.3	1.1	1.6	1.6	100%
Per Week	-	14.5	24.9	19.3	14.1	13.0	0.7	-	-	-	4.5	8.9	100%
Per Month	-	13.1	19.9	3.9	6.8	7.8	1.5	0.5	3.9	-	4.9	37.9	100%

TABLE 4.9 Station 2 (Hwy. 410)

Frequency of Auto Trips by Percentage

Times	<1	1	2	3	4	5	6	7	8	9	10	>10	Total
Per Week	-	4.4	10.4	5.8	4.1	58.7	6.2	1.1	0.3	-	7.3	1.7	100%
Per Month	1.2	8.8	21.2	8.2	12.3	2.0	2.3	-	3.9	-	2.0	38.1	100%

Frequency of Truck Trips by Percentage

Times	<1	1	2	3	4	5	6	7	8	9	10	>10	Total
Per Day	-	17.1	33.4	9.8	6.7	5.3	3.4	6.5	7.0	-	1.4	9.3	100%
Per Week	-	16.3	28.0	13.4	13.0	11.8	1.6	1.2	2.4	-	2.8	9.4	100%
Per Month	-	15.9	17.4	13.0	9.4	0.7	2.9	-	5.1	-	4.3	31.2	100%

SUMMARY OF FINDINGS

The licence plate recorded technique was applied to study the auto and truck travel patterns on Hwy. 7 eastbound traffic near Airport Road and Hwy. 410 southbound, south of Steeles Av. The major findings of this analysis are highlighted under their relevant sections of this text as below:

Section	Major Findings
2.5 Response	The codeable response rate was 25.8% of the mailed out questionnaires
2.6 Expansion Factors	Useable survey samples were:

	Sample % Auto	Truck
Station 1 (Hwy. 7)	8.7	50.8
Station 2 (Hwy. 410)	7.0	29.8

3.2 Commercial Vehicle	During the twelve hour survey on Hwy. 7, a total of 14,129 vehicles 6.5% were commercial and on Hwy. 410 of 6098 total vehicles 14.6% were commercial
4.2 Hourly Distribution of Auto Trip Purpose	On Hwy. 7, 60% of auto traffic observed were home to work and vice versa trips, 17% were shopping and personal, 11% were business trips and another 11% were recreation and others. During the 7:00 - 8:00 AM period, the home to work trips reached up to 87.8%. On Hwy. 410, 61% of auto traffic observed were home-to-work trips, 20% were business, 10% were shopping and 9% were recreational and others. During the 7 - 8 AM rush hour, 92,9% were home to work trips.
4.3 Auto Occupancy	On Hwy. 7 the average was 1.38 persons per car, with the lowest 1.13 persons for the work to home trips and the highest 2.01 persons for recreational and others. On Hwy. 410, the average was 1.21 persons per car, with the lowest 1.09 persons for the work to home trips and the highest 1.62 persons for the shopping and personal.

4.4 Auto and Truck Trip Distribution Pattern

For Station 1 on Hwy. 7, 90% of the trips originated from Brampton. The destinations were more dispersed, but there was a clear westeast tendency north of highway 401 which, in the future, could attract traffic to highway 407.

For Station 2 on Hwy. 410, Brampton was also the main generator with more than 95% of the auto work origins. The destinations presented a clear northsouth movement tendency with less than 10% of the auto work trips during the peak hour that could go to highway 407. The case of trucks is different with the possibility of 33% of them attracted to a future highway 407.

4.5 Trip Length Frequency Distribution

The weighted mean trip on Hwy. 7 for the 7 - 9 AM auto trips were 16 miles; for the 7 - 7 period 18 miles; and for the trucks 22 miles.

On Hwy. 410, the weighted mean trip for the 7 - 9 AM auto trips were 18 miles, for the 7 - 7 period 19 miles; and for trucks 30 miles.

4.6 Trip Frequency

On Hwy. 7, 67.7% of the autos made five trips per week and 53.7% of the trucks made two trips per day.

On Hwy. 410, 58.7% of the autos made five trips per week and 33.4% of the trucks made two trips per day.

APPENDIX

Ministry of
Transportation and
Communications

Ontario

APPENDIX A

Dear Sir/Madam:

Hwy. 7 AUTO

The Ministry of Transportation and Communications is conducting a traffic survey to establish travel characteristics on the provincial transportation network. Please see the enclosed letter for further details.

BANIK,MICHAEL
57 ANTIOCH DR
ISLINGTON, ONTARIO
M9B 5V5

To ensure confidentiality you may detach the portion of the questionnaire above this line.

If you were driving your car eastbound on Hwy 7 in the vicinity of Airport Rd. between the hours of 9:00 and 10:00 on June 4 1985, please answer the following questions regarding your trip, and return the questionnaire in the envelope provided.

If a person other than yourself was driving the vehicle at the location, please ask him or her to complete and return the questionnaire.

1. Where did your trip begin?

   City/Town _____
   Address (or nearest major intersection)

   _____

2. Where did your trip end?
   City/Town _____
   Address (or nearest major intersection)

   _____

3. What was the purpose of the trip?

(a) Home to work	☐	(d) Shopping	☐
(b) Work to home	☐	(e) Recreational	☐
(c) Business trip other than (a) or (b)	☐	(f) Personal	☐
		(g) Other	☐

4. How many people, including the driver, were in the car? ____

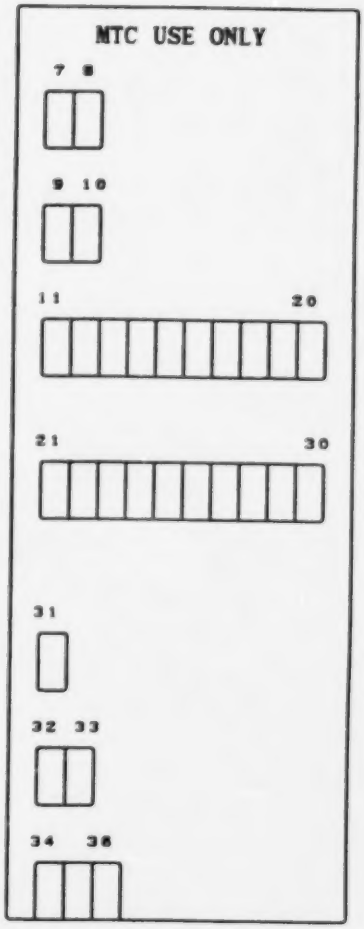
5. How often do you make this same trip?
   _____times per week, or _____ times per month,
   or ☐ less than once per month.

6. Comments

   _____

   _____

MTC USE ONLY



Auto

Ministry of
Transportation and
Communications

APPENDIX A

Hwy. 7 TRUCK

Dear Sir/Madam:

The Ministry of Transportation and Communications is conducting a traffic survey to establish travel characteristics on the provincial transportation network. Please see the enclosed letter for further details.

DALTON,PETER,M
251 CARRVILLE RD
RICHMOND HILL, ONTARIO
L4C 6E4

If the vehicle with plate number BA5863 was being driven east on Hwy 7 in the vicinity of Airport Road on June 4, 1985 between the hours of 9:00 and 10:00, please answer the following questions regarding your trip, and return the questionnaire in the envelope provided.

If a person other than yourself was driving the vehicle at that location, please ask him or her to complete and return the questionnaire.

1. What was the origin of the run?

   City/Town _____
   Address (or nearest major intersection)

   _____

2. What was the furthest destination of the run?

   City/Town _____
   Address (or nearest major intersection)

   _____

3. How often do you travel Hwy 7 in this vicinity?
   ___ times per day,
   ___ times per week,
   ___ times per month

4. What type of vehicle were you driving?
   1. Box 2. Van 3. Stake/Flat Bed
   4. Tank 3. Cement Mixer 6. Container
   7. Auto Carrier 8. Other, Specify———

5. Is your truck licence for
   1. P.C.V. for hire 2. Private
   3. Intercorporate 4. Owner Operator

6. Comments

   _____

MTC USE ONLY

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Ontario Ministry of Transportation and Communications

APPENDIX A

Hwy. 410 AUTO

Dear Sir/Madam:

The Ministry of Transportation and Communications is conducting a traffic survey to establish travel characteristics on the provincial transportation network. Please see the enclosed letter for further details.

BELLI,NATALE
21 FENNIMORE CR
DOWNSVIEW, ONTARIO
M3N 1G9

To ensure confidentiality you may detach the portion of the questionnaire above this line.

If you were driving your car southbound on Hwy 410 on June 4, 1985, in the vicinity of Steeles Ave. between the hours of 3:00 and 4:00, please answer the following questions regarding your trip, and return the questionnaire in the envelope provided.

If a person other than yourself was driving the vehicle at the location, please ask him or her to complete and return the questionnaire.

1. Where did your trip begin?

   City/Town_____
   Address (or nearest major intersection)

   _____

2. Where did your trip end?

   City/Town _____
   Address (or nearest major intersection)

   _____

3. What was the purpose of the trip?

(a) Home to work	☐	(d) Shopping	☐
(b) Work to home	☐	(e) Recreational	☐
(c) Business trip other than (a) or (b)	☐	(f) Personal	☐
		(g) Other	☐

4. How many people, including the driver, were in the car? ____

5. How often do you make this same trip?
   _____times per week, or _____ times per month,
   or ☐ less than once per month.

6. Comments

   _____ _____

   _____

MTC USE ONLY

7 8

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34 36

Auto

Ministry of
Transportation and
Communications

Ontario

APPENDIX A

Dear Sir/Madam:

Hwy. 410 TRUCK

The Ministry of Transportation and Communications is conducting a traffic survey to establish travel characteristics on the provincial transportation network. Please see the enclosed letter for further details.

WONG,JAMES
1165 YONGE STREET
TORONTO, ONTARIO
R2K 4U5

If the vehicle with plate number AB3456 was being driven southbound on Hwy 410 in the vicinity of Steeles Ave. between the hours of 9:00 and 10:00, on June 4, 1985, please answer the following questions about your trip, and return the questionnaire in the envelope provided.

If a person other than yourself was driving the vehicle at that location, please ask him or her to complete and return the questionnaire.

1. What was the origin of the run?

   City/Town _____
   Address (or nearest major intersection)

   _____

2. What was the furthest destination of the run?

   City/Town _____
   Address (or nearest major intersection)

   _____

3. How often do you travel Hwy 410 in this vicinity?
   ___ times per day,
   ___ times per week,
   ___ times per month

4. What type of vehicle were you driving?
   1. Box 2. Van 3. Stake/Flat Bed
   4. Tank 3. Cement Mixer 6. Container
   7. Auto Carrier 8. Other, Specify———

5. Is your truck licence for
   1. P.C.V. for hire 2. Private
   3. Intercorporate 4. Owner Operator

6. Comments

   _____

MTC USE ONLY

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APPENDIX B

VEHICLE CLASSIFICATION COUNT
Hwy. 7 (West of Airport Road) June 4, 1985

Hour	EASTBOUND						WESTBOUND					
	Auto	Truck			Bus	Vehicle Total	Auto	Truck			Bus	Vehicle Total
		Short	Long	Total				Short	Long	Total		
7 - 8	2337	38	23	61	6	2404	804	33	17	50	2	856
8 - 9	1750	47	37	84	7	1841	843	45	20	65	8	916
9 - 10	804	41	27	68	4	876	670	60	50	110	6	786
10 - 11	694	49	33	82	-	776	612	44	51	95	3	710
11 - 12	742	45	38	83	4	829	778	37	41	78	-	856
12 - 13	822	55	21	76	1	899	820	45	29	74	2	896
13 - 14	812	64	36	100	-	912	836	48	38	86	2	924
14 - 15	883	55	32	87	3	973	759	28	27	55	2	816
15 - 16	1038	53	35	88	7	1133	1144	47	16	63	4	1211
16 - 17	1216	35	35	70	-	1286	2058	40	31	71	6	2135
17 - 18	1175	38	16	54	-	1229	2324	35	11	46	-	2370
18 - 19	935	21	14	35	1	971	1542	26	7	33	3	1578
TOTAL:	**13208**	**541**	**347**	**888**	**33**	**14129**	**13190**	**488**	**338**	**826**	**38**	**14054**

12 Hr. Truck & Bus % 6.5% E.B.
6.1% W.B.

APPENDIX B

VEHICLE CLASSIFICATION COUNT
Hwy. 410 (South of Steeles Ave.) June 4, 1985

Hour	EASTBOUND						WESTBOUND					
	Auto	Truck			Bus	Vehicle Total	Auto	Truck			Bus	Vehicle Total
		Short	Long	Total				Short	Long	Total		
7 - 8	747	20	29	49	4	800	698	17	44	61	1	760
8 - 9	531	38	50	88	2	621	554	34	34	68	1	623
9 - 10	336	41	43	84	1	421	350	43	37	80	3	433
10 - 11	273	46	42	88		361	309	38	47	85	1	395
11 - 12	279	43	47	90		369	292	37	54	91		383
12 - 13	311	44	34	78	1	390	292	39	56	95	1	388
13 - 14	280	42	50	92		372	306	42	61	103		409
14 - 15	353	37	53	90	3	446	440	38	52	90		530
15 - 16	519	37	40	77	1	597	549	48	49	97	1	647
16 - 17	623	45	28	73	1	697	775	28	42	70	5	850
17 - 18	522	10	26	36		558	682	29	24	53	2	737
18 - 19	433	12	18	30	3	466	555	5	15	20		575
TOTAL:	**5207**	**415**	**460**	**875**	**16**	**6098**	**5802**	**398**	**515**	**913**	**15**	**6730**

12 Hr. Truck & Bus % 14.6% S.B.
13.8% N.B.

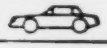
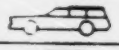
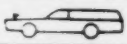
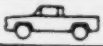
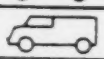
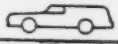
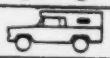
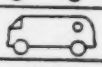
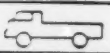
Ministry of Transportation and Communications
Ontario

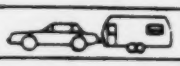
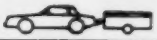
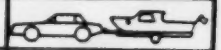
APPENDIX C

VEHICLE CLASSIFICATION

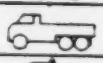
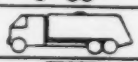
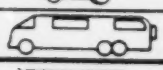
(GROUPING OF VEHICLE TYPES)

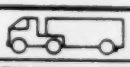
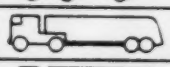
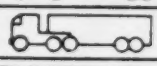
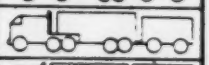
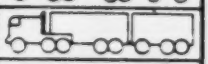
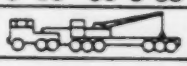
PB - TS - 84 i-78

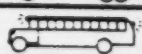
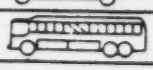
GROUP	VEHICLE TYPE	
CARS	PASSENGER CAR	
	STATION WAGON	
	JEEP PASSENGER	
	HEARSE	
	AMBULANCE	
	TAXI	
	PICKUP	
	PANEL	
	SEDAN DELIVERY	
	PICKUP WITH LIVING QUARTERS	
	VAN (SINGLE REAR TIRE) INCLUDING SCHOOL BUS VAN	
	JEEP TOW TRUCK	
	LIGHT TRUCK (SINGLE REAR TIRE)	

GROUP	VEHICLE TYPE	
CARS WITH TRAILER	CAR WITH TRAILER — ANY CAR ON THE LEFT TOWING A HOUSE, CAMPER, BOAT, OR TRAILER OF ANY TYPE. EXAMPLES ARE :	
	VEHICLE PULLING HOUSE TRAILER	
	VEHICLE PULLING BOX TRAILER	
	VEHICLE PULLING BOAT	
	LIGHT TRUCK WITH TRAILER	

CARS AND CARS WITH TRAILER WITH LICENCES FROM ANY PROVINCE OR STATE OUTSIDE ONTARIO ARE RECORDED UNDER THE HEADING 'OTHER'.

SHORT TRUCKS (HEAVY 2 & 3 AXLE - SINGLE UNITS)		
	HEAVY TRUCK (DUAL REAR TIRES)	
	DUMP TRUCK	
	STAKE TRUCK	
	TRACTOR WITHOUT TRAILER (2 AXLES)	
	SINGLE UNIT TRUCKS WITH 3 AXLES	
	TRACTOR WITHOUT TRAILER (3 AXLES)	
	TANK TRUCK (SINGLE UNIT)	
	VAN (DUAL REAR TIRES)	
	MOTOR HOME	

LONG TRUCKS (TRANSPORTS - COMBINATION UNITS)		
	COMBINATION UNIT (3 AXLES)	
	COMBINATION UNIT (4 AXLES)	
	COMBINATION UNIT (5 AXLES)	
	COMBINATION UNIT (6 AXLES)	
	COMBINATION UNIT (7 AXLES)	
	COMBINATION UNIT (8 AXLES)	
	COMBINATION UNIT (9 AXLES)	

BUSES		
	SCHOOL BUS	
	REGULAR BUS	

SPECIAL		
	SPECIAL VEHICLE - AS DEFINED FOR SPECIAL PURPOSES (MAY BE A MOTORCYCLE, SNOWMOBILE, FARM TRACTOR, ETC.)	
	MOTORCYCLE	
	SNOWMOBILE	
	FARM TRACTOR	

APPENDIX D

HOURLY DISTRIBUTION OF AUTO VOLUME BY TRIP PURPOSE
STATION 1 HWY. 7

Hour Ending	Home-To-Work	Work-To-Home	Business	Shopping Personal	Recreation Other	Blank	Total
7 - 8	2052	94	95	39	57	0	2337
8 - 9	1394	59	99	80	96	10	1738
9 - 10	300	10	174	155	165	0	804
10 - 11	97	25	134	268	170	0	694
11 - 12*	0	0	0	0	0	0	0
12 - 13	127	34	195	339	119	8	822
13 - 14	120	81	199	225	160	0	785
14 - 15	294	61	147	220	149	12	883
15 - 16	291	280	187	140	140	0	1038
16 - 17	161	678	97	194	86	0	1216
17 - 18	148	616	80	239	92	0	1175
18 - 19	252	281	30	208	134	30	935
TOTAL:	**5236**	**2219**	**1437**	**2107**	**1368**	**60**	**12427**

* No data available for this period

APPENDIX D

HOURLY DISTRIBUTION OF AUTO VOLUME BY TRIP PURPOSE
STATION 2 HWY. 410

Hour Ending	Home-To-Work	Work-To-Home	Business	Shopping Personal	Recreation Other	Blank	Total
7 - 8	694	36	17	0	0	0	747
8 - 9	454	29	28	10	10	0	531
9 - 10	50	16	185	51	34	0	336
10 - 11	51	0	137	51	34	0	273
11 - 12	16	33	115	99	16	0	279
12 - 13	86	0	104	86	35	0	311
13 - 14	82	16	101	32	49	0	280
14 - 15	134	17	151	0	51	0	353
15 - 16	135	151	117	66	33	17	519
16 - 17	78	412	33	56	44	0	623
17 - 18	54	335	27	53	53	0	522
18 - 19	81	202	40	28	68	14	433
TOTAL:	**1915**	**1247**	**1055**	**532**	**427**	**31**	**5207**

APPENDIX E
ZONE TRIPS ORIGINS AND DESTINATIONS BY AUTO AND TRUCK
STATION 1

	Auto Trips								Truck Trips	
	7 AM - 7 PM Work				7 AM - 9 AM Non-Work					
			Non-Work						7AM	7PM
Zones	O	D	O	D	O	D	O	D	O	D
1	0	44	19	55	0	20	0	0	2	0
2	0	78	0	12	0	10	0	0	0	2
3	0	61	0	32	0	10	0	0	0	3
4	0	23	12	23	0	0	0	0	0	0
5	0	10	0	0	0	10	0	0	3	6
6	0	33	0	13	0	20	0	0	0	7
7	0	42	0	45	0	10	0	0	0	46
8	0	10	0	23	0	10	0	10	0	2
9	0	95	0	39	0	68	0	0	1	10
10	0	51	0	12	0	39	0	0	0	6
11	0	20	0	23	0	10	0	0	0	2
12	11	65	0	27	0	30	0	0	1	2
13	0	41	0	20	0	20	0	0	0	2
14	0	33	8	74	0	10	0	20	0	0
15	0	11	0	0	0	0	0	0	0	0
16	0	90	0	22	0	29	0	10	0	0
17	0	63	0	56	0	20	0	10	0	4
18	0	32	0	22	0	10	0	0	0	2
19	0	51	0	15	0	20	0	0	0	6
20	0	11	0	11	0	0	0	0	0	0
21	0	0	0	30	0	0	0	0	2	1
22	0	0	0	36	0	0	0	0	0	4
23	0	64	12	0	0	39	0	0	0	2
24	0	31	11	11	0	19	0	0	0	0
25	0	71	0	59	0	30	0	10	0	2
26	0	20	0	10	0	20	0	0	0	4
27	0	59	0	30	0	30	0	0	0	14
28	20	50	0	0	10	50	0	0	0	3

APPENDIX E
ZONE TRIPS ORIGINS AND DESTINATIONS BY AUTO AND TRUCK
STATION 1

	Auto Trips								Truck Trips	
	7 AM - 7 PM Work				7 AM - 9 AM Non-Work					
Zones	O	D	O	D	O	D	O	D	7AM O	7PM D
29	10	461	21	142	0	339	10	0	5	70
30	10	434	0	193	0	331	0	30	2	22
31	11	621	13	140	0	455	0	30	1	33
32	0	468	18	168	0	241	10	20	5	26
33	11	201	0	53	0	96	0	10	0	8
34	0	139	0	20	0	96	0	0	3	6
35	0	122	0	23	0	39	0	0	0	0
36	0	64	11	69	0	19	0	0	0	6
37	0	36	13	85	0	10	0	19	0	8
38	0	56	0	21	0	10	0	10	0	0
39	0	93	0	29	0	39	0	0	0	1
40	0	34	12	20	0	0	0	0	0	2
41	0	10	0	11	0	10	0	0	1	4
42	0	33	0	30	0	10	0	30	2	3
43	0	11	0	8	0	0	0	0	0	6
44	0	38	12	30	0	0	0	0	0	1
45	0	11	0	0	0	0	0	0	0	3
46	0	10	0	0	0	10	0	0	0	0
47	0	0	0	0	0	0	0	0	0	0
48	0	0	0	22	0	0	0	0	0	4
49	0	11	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	2
51	0	30	0	10	0	0	0	20	0	2
52	0	22	0	0	0	10	0	0	0	2
53	0	0	12	0	0	0	0	0	0	0
54	0	0	8	0	0	0	0	0	2	5
55	0	72	0	0	0	0	0	0	0	2
56	0	0	0	0	0	0	0	0	0	0

APPENDIX E
ZONE TRIPS ORIGINS AND DESTINATIONS BY AUTO AND TRUCK
STATION 1

	Auto Trips								Truck Trips	
	7 AM - 7 PM Work		7 PM - 7 AM Non-Work		7 AM - 9 AM Work		9 AM - 7 AM Non-Work		7AM - 7PM	
Zones	O	D	O	D	O	D	O	D	O	D
57	0	0	0	8	0	0	0	0	0	0
58	0	0	0	0	0	0	0	0	0	6
59	0	0	13	0	0	0	0	0	0	3
60	0	0	0	0	0	0	0	0	1	0
61	0	0	23	23	0	0	0	0	0	0
62	0	0	0	0	0	0	0	0	0	0
63	0	0	25	26	0	0	0	0	0	0
64	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	0
66	0	0	15	0	0	0	0	0	0	0
67	0	11	0	0	0	0	0	0	0	0
68	0	12	0	0	0	0	0	0	0	0
69	0	73	12	22	0	0	0	10	1	7
70	0	42	0	34	0	20	0	0	0	7
71	0	24	0	35	0	0	0	0	5	4
72	0	11	0	0	0	0	0	0	0	6
73	0	41	0	0	0	0	0	0	0	8
74	13	152	21	38	0	48	0	0	2	10
75	0	0	0	0	0	0	0	0	0	1
76	0	24	0	24	0	0	0	0	0	4
77	0	0	0	42	0	0	0	10	0	7
78	0	0	0	0	0	0	0	0	0	1
79	0	29	0	37	0	10	0	10	1	7
80	0	44	0	32	0	10	0	10	0	3
81	0	36	10	46	0	10	10	10	0	3
82	22	50	12	10	0	19	0	10	0	2
83	0	63	0	67	0	29	0	0	0	13

APPENDIX E
ZONE TRIPS ORIGINS AND DESTINATIONS BY AUTO AND TRUCK
STATION 1

Zones	Auto Trips: 7 AM - 7 PM Work O	7 AM - 7 PM Work D	7 AM - 7 PM Non-Work O	7 AM - 7 PM Non-Work D	7 AM - 9 AM Work O	7 AM - 9 AM Work D	7 AM - 9 AM Non-Work O	7 AM - 9 AM Non-Work D	Truck Trips 7AM O	Truck Trips 7PM D
84	0	23	0	74	0	0	0	0	2	11
85	0	86	19	12	0	39	0	0	0	18
86	0	0	0	0	0	0	0	0	0	0
87	10	382	0	102	10	230	0	0	16	62
88	0	128	0	40	0	78	0	0	2	20
89	0	55	0	26	0	0	0	0	0	2
90	0	42	0	26	0	30	0	0	2	8
91	0	135	0	152	0	49	0	50	0	17
92	102	153	94	51	39	49	0	10	14	49
93	130	0	49	18	49	0	10	0	6	0
94	182	26	86	24	79	0	20	0	28	5
95	0	0	10	20	0	0	0	0	1	0
96	55	97	75	220	10	39	10	39	35	22
97	1866	339	1282	354	644	215	129	0	153	38
98	517	64	284	100	136	19	29	10	134	17
99	2313	109	563	79	1601	29	119	29	90	17
100	1103	12	455	12	834	0	50	0	134	20
101	39	12	92	0	20	10	30	0	3	5
102	78	0	12	0	0	10	0	0	26	11
103	108	241	142	151	10	244	0	10	27	22
104	34	82	23	28	0	76	0	0	8	5
105	12	10	33	18	0	10	0	10	17	4
106	0	0	8	0	0	0	0	0	1	0
107	0	0	0	0	0	0	0	0	0	0
108	10	0	13	0	10	0	0	0	2	0
109	8	10	52	0	0	10	10	0	6	2
110	0	11	0	0	0	0	0	0	2	0

APPENDIX E
ZONE TRIPS ORIGINS AND DESTINATIONS BY AUTO AND TRUCK
STATION 1

	Auto Trips								Truck Trips	
	7 AM - 7 PM Work		7 PM - 7 AM Non-Work		7 AM - 9 AM Work		9 AM - 7 AM Non-Work		7AM - 7PM	
Zones	O	D	O	D	O	D	O	D	O	D
111	0	0	8	0	0	0	0	0	2	0
112	80	0	99	12	80	0	10	0	32	6
113	10	0	0	0	10	0	0	0	4	0
114	0	0	0	0	0	0	0	0	2	0
115	0	0	0	0	0	0	0	0	3	0
116	0	0	0	0	0	0	0	0	0	0
117	0	0	13	0	0	0	0	0	0	0
118	0	0	0	0	0	0	0	0	2	0
119	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	4	0
121	0	0	0	0	0	0	0	0	0	0
122	0	0	0	0	0	0	0	0	0	0
123	0	0	0	0	0	0	0	0	0	0
124	0	0	12	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0
126	0	0	0	0	0	0	0	0	1	0
127	0	0	0	0	0	0	0	0	0	0
TOTAL	6765	6765	3737	3737	3542	2542	447	447	799	799

APPENDIX E
ZONE TRIPS ORIGINS AND DESTINATIONS BY AUTO AND TRUCK
STATION 2

	Auto Trips								Truck Trips	
	7 AM - 7 PM				7 AM - 9 AM					
	Work		Non-Work		Work		Non-Work		7AM	7PM
Zones	O	D	O	D	O	D	O	D	O	D
1	0	58	0	77	0	45	0	27	0	9
2	0	58	0	83	0	28	0	0	0	5
3	0	36	0	125	0	36	0	0	0	9
4	0	65	0	40	0	0	0	0	0	0
5	0	35	0	17	0	18	0	0	0	19
6	0	73	0	33	0	10	0	0	0	4
7	0	71	0	34	0	0	0	0	0	4
8	0	99	0	17	0	28	0	0	0	7
9	0	21	0	48	0	10	0	0	0	4
10	0	27	0	47	0	10	0	0	0	6
11	0	48	0	17	0	0	0	0	0	4
12	0	35	0	0	0	10	0	0	0	4
13	0	0	0	11	0	0	0	0	0	4
14	0	11	0	33	0	0	0	0	0	1
15	0	0	0	11	0	0	0	0	0	4
16	0	13	0	34	0	0	0	0	0	7
17	0	48	0	0	0	18	0	0	3	7
18	0	11	0	0	0	0	0	0	0	0
19	0	17	0	17	0	0	0	0	0	1
20	0	27	0	11	0	0	0	0	0	0
21	0	85	0	0	0	10	0	0	0	1
22	0	13	0	17	0	0	0	0	0	0
23	0	206	0	27	0	117	0	10	3	24
24	0	53	0	34	0	18	0	0	0	0
25	0	57	16	17	0	0	0	0	0	6
26	0	53	0	11	0	0	0	0	4	1

APPENDIX E
ZONE TRIPS ORIGINS AND DESTINATIONS BY AUTO AND TRUCK
STATION 2

	Auto Trips								Truck Trips	
	7 AM - 7 PM Work		7 PM - 7 AM Non-Work		7 AM - 9 AM Work		9 AM - 7 AM Non-Work		7AM - 7PM	
Zones	O	D	O	D	O	D	O	D	O	D
27	0	231	0	101	0	101	0	0	0	33
28	0	56	0	65	0	10	0	0	0	5
29	0	80	0	28	0	63	0	0	0	30
30	0	16	16	16	0	0	0	0	0	4
31	0	28	0	0	0	0	0	0	0	4
32	0	0	0	0	0	0	0	0	0	0
33	0	30	0	0	0	0	0	0	0	1
34	0	13	0	0	0	0	0	0	0	10
35	0	0	0	0	0	0	0	0	0	1
36	0	0	0	0	0	0	0	0	8	2
37	0	38	0	14	0	10	0	0	0	1
38	0	18	0	0	0	18	0	0	0	1
39	0	0	0	34	0	0	0	0	0	0
40	0	0	0	47	0	0	0	0	0	5
41	0	25	0	0	0	0	0	0	0	6
42	0	11	0	25	0	0	0	0	0	4
43	0	11	0	0	0	0	0	0	0	0
44	0	17	0	17	0	0	0	0	0	20
45	0	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0	0
47	0	11	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	0	0	0
50	0	0	0	16	0	0	0	0	0	0
51	0	0	0	17	0	0	0	0	0	0
52	0	0	0	0	0	0	0	0	0	5
53	0	0	0	0	0	0	0	0	0	0

APPENDIX E
ZONE TRIPS ORIGINS AND DESTINATIONS BY AUTO AND TRUCK
STATION 2

	Auto Trips								Truck Trips	
	7 AM - 7 PM Work		7 AM - 9 AM Non-Work							
Zones	O	D	O	D	O	D	O	D	7AM O	7PM D
54	0	13	0	51	0	0	0	0	0	10
55	0	11	16	17	0	0	0	0	0	9
56	0	0	0	0	0	0	0	0	0	3
57	0	25	0	16	0	0	0	0	0	0
58	0	0	0	0	0	0	0	0	0	8
59	0	0	0	17	0	0	0	0	0	8
60	0	0	0	0	0	0	0	0	3	0
61	0	0	0	0	0	0	0	0	0	8
62	0	0	0	0	0	0	0	0	0	1
63	0	0	0	0	0	0	0	0	0	4
64	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0	0	0	4
67	0	0	0	0	0	0	0	0	0	0
68	0	0	0	17	0	0	0	0	0	0
69	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0	0	0	10
72	0	0	0	0	0	0	0	0	4	0
73	0	0	0	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0	0	0	4
78	0	27	0	17	0	10	0	0	0	7
79	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0

APPENDIX E
ZONE TRIPS ORIGINS AND DESTINATIONS BY AUTO AND TRUCK
STATION 2

Zones	Auto Trips: 7 AM - 7 PM Work O	Work D	Non-Work O	Non-Work D	7 AM - 9 AM Work O	Work D	Non-Work O	Non-Work D	Truck Trips: 7AM O	7PM D
81	0	0	0	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0	0	0	0
85	0	0	0	0	0	0	0	0	0	4
86	0	0	0	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0	0	0	9
88	0	0	0	0	0	0	0	0	0	0
89	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	1	1
91	0	0	0	0	0	0	0	0	0	3
92	55	0	43	0	38	0	10	0	16	5
93	58	0	16	0	30	0	0	0	9	0
94	157	0	33	0	93	0	0	0	20	1
95	0	0	0	0	0	0	0	0	0	0
96	0	0	17	0	0	0	0	0	0	0
97	693	41	288	0	129	0	20	0	159	32
98	1014	0	706	57	276	0	10	10	213	47
99	233	0	127	16	137	0	0	0	39	10
100	823	0	544	0	481	0	27	0	87	13
101	10	80	11	37	10	55	0	10	14	16
102	0	270	34	94	0	227	0	10	31	106
103	0	61	0	98	0	27	0	0	10	8
104	0	114	0	28	0	36	0	0	0	10
105	0	270	30	107	0	103	0	0	20	6
106	0	60	0	84	0	47	0	0	0	3
107	0	49	0	17	0	0	0	0	8	4

APPENDIX E
ZONE TRIPS ORIGINS AND DESTINATIONS BY AUTO AND TRUCK
STATION 2

	Auto Trips								Truck Trips	
	7 AM Work		7 PM Non-Work		7 AM Work		9 AM Non-Work		7AM	7PM
Zones	O	D	O	D	O	D	O	D	O	D
108	13	91	0	0	0	0	0	0	4	15
109	0	58	13	25	0	47	0	0	3	4
110	0	29	0	77	0	18	0	0	4	5
111	0	0	17	0	0	0	0	0	3	4
112	10	0	31	0	10	0	0	0	4	4
113	0	10	0	16	0	10	0	0	4	5
114	11	11	0	26	0	0	0	0	0	8
115	0	13	0	0	0	0	0	0	0	0
116	0	0	0	0	0	0	0	0	0	0
117	0	10	0	0	0	10	0	0	3	0
118	0	29	0	0	0	18	0	0	0	0
119	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0
121	0	0	0	0	0	0	0	0	0	0
122	0	0	0	0	0	0	0	0	0	0
123	0	0	0	0	0	0	0	0	0	3
124	0	0	0	0	0	0	0	0	0	4
125	0	0	0	0	0	0	0	0	0	3
126	0	0	0	0	0	0	0	0	3	0
127	0	0	0	0	0	0	0	0	0	0
TOTAL:	3077	3077	1958	1958	1204	1204	67	67	672	672